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DIVISION OF TUBERCULOSIS CONTROL

Bureau of Communicable Disease Control

ANNUAL REPORT, 1990

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

David Mulligan, Commissioner

Alfred DeMaria, M.D., Assistant Commissioner

DIVISION OF TUBERCULOSIS CONTROL

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INTRODUCTION

Massachusetts continues to be among the top 20 states with the highest prevalence of tuberculosis. In 1990, 439 cases (case rate of 7.45 per 100,000 population) were reported and verified. This represents a 14% increase in only 2 years and appears to parallel trend that has been noted on the national level. Increases in TB cases occurred in all high risk groups in the State. These include: the homeless, intravenous drug users, the HIV infected, the elderly, the foreign born, persons in correctional facilities and all minority groups. Given that each of these cases potentially transmits their disease, thereby adding to the current pool of infected persons (estimated to be over 100,000) in the Commonwealth, these increases have serious implications.

This Report, consisting of data from several sources, is a summary and analysis of calendar year 1990 tuberculosis (TB) morbidity and control activities. Tuberculosis morbidity information is collected from health care providers, including Health Departments, hospitals and private physicians.

The Division of Tuberculosis Control is charged with all aspects of disease surveillance and control. This Report highlights these activities and the accomplishments of the Division staff despite tight fiscal constraints and personnel shortages. Tuberculosis continues to be a significant cause of morbidity in Massachusetts and given current resources, the prospects for its elimination are not encouraging.

Recognition and thanks for continuing the battle against an ancient foe are extended to our field staff, the local Health Departments and Boards of Health, the American Lung Association of Massachusetts, hospitals, nursing homes, physicians and other health care providers.

Alfred DeMaria, M. D.

Sue Etkind

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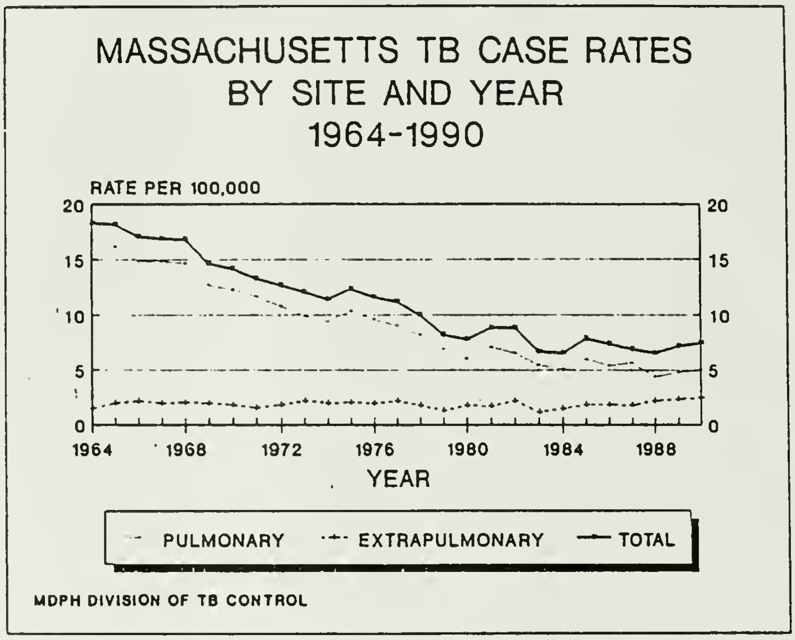
PART I

TUBERCULOSIS MORBIDITY

A. DEMOGRAPHICS

Massachusetts continues to be ranked among the top 20 States with the highest tuberculosis case rates in the United States. In 1990, 439 cases were reported and verified. This figure represents a **4.3 PERCENT INCREASE** in cases since 1989 and a **15%** increase in only 2 years. A total of 18 "high risk" cities had case rates above the State average - the highest of which was the City of Boston (25.95 per 100,000). Boston cases increased by 4.9% in 1990. The City of Brockton followed with a case rate of 21.66/100,000 - more than **DOUBLE** that of the previous year. One city (Worcester) was **added** to the "High Risk" city list this year (Appendix 1). Substantial increases in tuberculosis cases were also noted in several other cities as well.


MASSACHUSETTS TB CASE RATES
BY SITE AND YEAR
1964-1990

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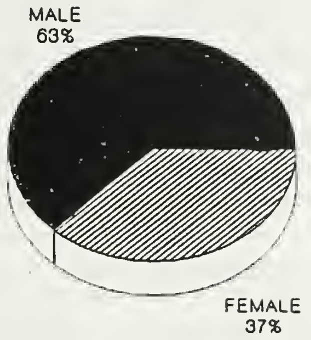
This year, for surveillance and comparison purposes, cities and towns are being ranked (for those with 3 or more cases) by their case rates (Appendix 2).

Demographic analysis of the 1990 tuberculosis cases as compared to the 1989 cases is as follows:

Age and Sex: (Appendix 3)

Of the 1990 tuberculosis cases which met the CDC count criteria, 63% were male and 37% were female (no significant change from 1989).

MASSACHUSETTS TUBERCULOSIS
CASES BY SEX
1990

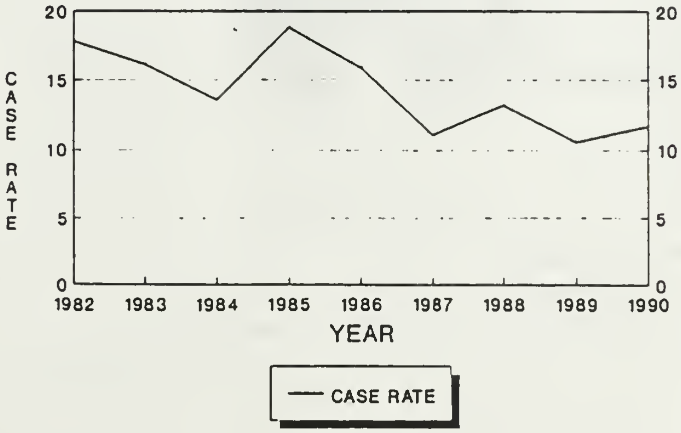


PERCENT OF CASES

Cases in children ages 0-14 yrs. in 1990 were unchanged overall from 1989 (5.5%), but **increases were noted in the 15-19 yr. age group. This is an age group where rates of sexually transmitted diseases and at risk sexual practices are increasing at alarming rates.**

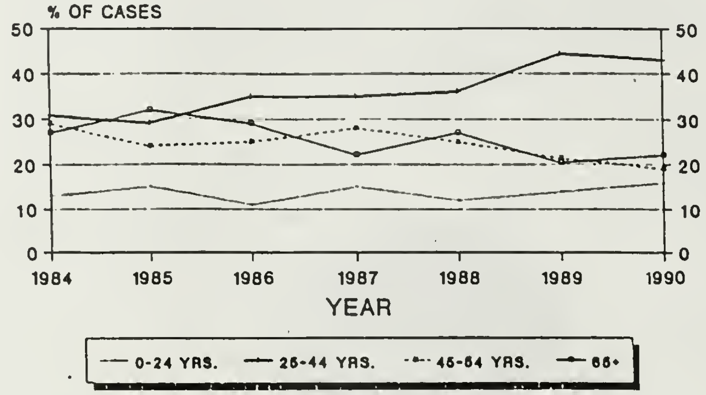
When cases in the elderly are analyzed, it is noted that while there has been no significant change in the percent of cases age 65 or older since 1989, a slight increase in the case rate was noted in 1990.

RATE OF TUBERCULOSIS IN PERSONS
AGE 65 AND OVER
MASSACHUSETTS 1982-1990



Slightly more than one half (57.2%) of the 1990 cases were in the 20-49 year age group. A breakdown of age categories for the last 6 years demonstrates the **UPWARD TREND** in this age group.

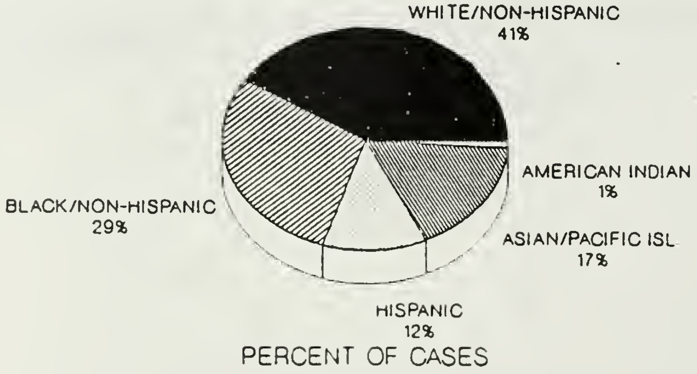
MASSACHUSETTS TUBERCULOSIS CASES
BY AGE GROUP AND YEAR
1984-1990



Race and Ethnicity: (Appendix 4)

This year, persons of color continue to account for **MORE THAN 50%** of the tuberculosis cases in Massachusetts (black/non hispanic 29%, hispanic 12%, Asian/Pacific Islanders 17% and American Indians 1%). This is a **17 PERCENT OVERALL INCREASE IN CASES AMONG COMMUNITIES OF COLOR IN THE LAST 4 YEARS, with black/non hispanics representing the greatest increase (10%).**

MASSACHUSETTS TUBERCULOSIS
CASES BY RACE/ETHNICITY
1990 (n=439)



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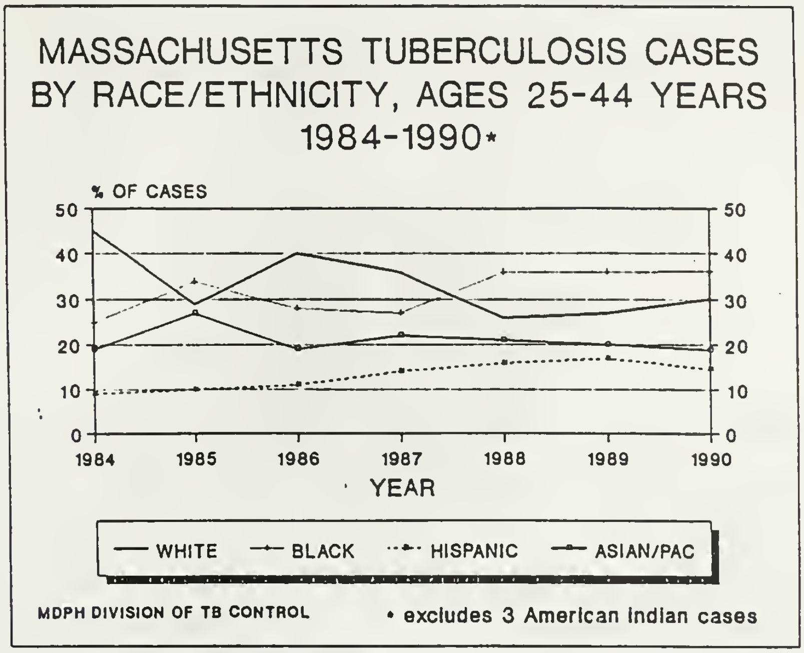
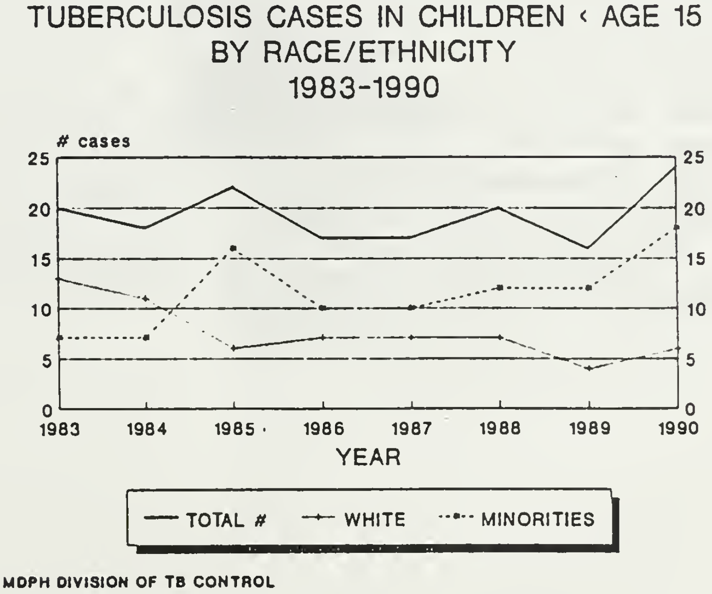
Looking specifically at the 25-44 year age group, it can be noted that cases in **persons of color account for 70% of all cases in this age group** (black/non-hispanic 36.2%, Hispanic 14.6% and Asian/Pacific Islanders 18.9%).



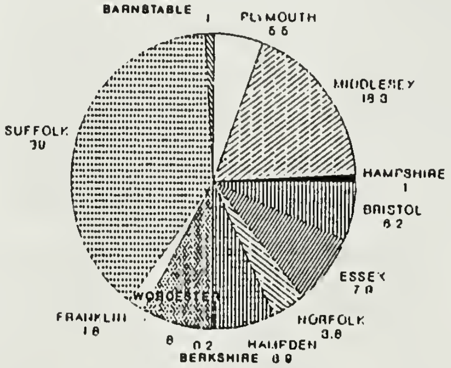
When the 1990 cases are analyzed by race/ethnicity and age group it can be noted that although the proportion of cases in children has remained the same, **82% OF THE CASES ARE AMONG PERSONS OF COLOR (a 7% increase since 1989).**



Residence:

Suffolk County continues to account for over one third (39%) of the tuberculosis cases in Massachusetts, followed by Middlesex County (18%). Two of the fourteen counties in Massachusetts are free of tuberculosis cases.

VERIFIED TUBERCULOSIS CASES BY COUNTY
1990 (N= 420)*



Percent of Cases

*19 other cases are state at large

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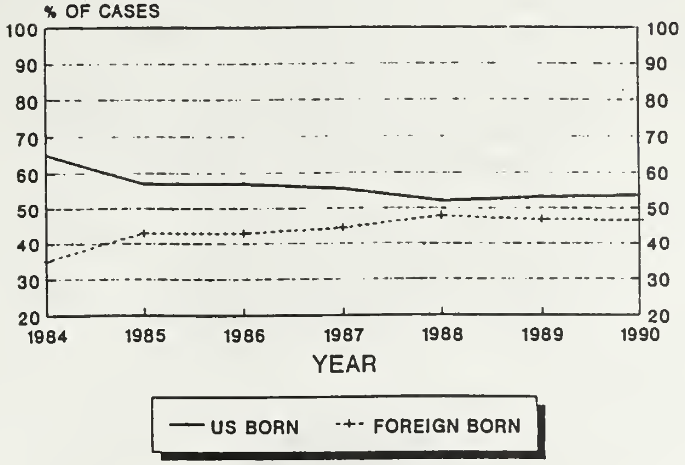
2 counties are free of TB

If the cases are analyzed by geographic district (Tuberculosis Surveillance Area - TSA), it can be noted that TSA D (Boston) continues to account for one third of the total cases, while the other tuberculosis cases are evenly distributed between the remaining three TSA's (A = 23%, B = 19%, C = 24%).

Country of Origin: (Appendix 5)

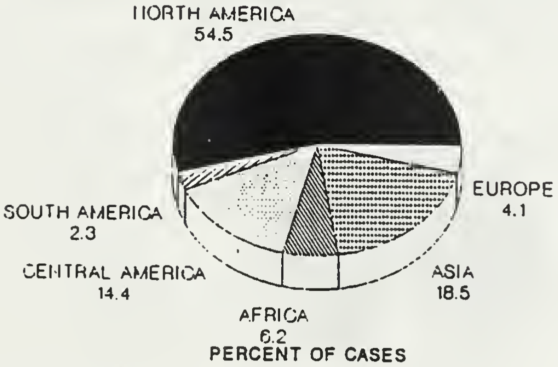
This year, to be consistent with the CDC reporting and to reflect the citizen status of persons born in Puerto Rico, the Division has changed it's "foreign born" category to include this group in the U.S. born definition. As a result, we have gone back and revised our previous year's data to reflect this more appropriate placement. That has meant that the foreign born cases now account for 46.5% of our over-all tuberculosis cases (a figure similar to 1989). The foreign born **REMAIN THE HIGHEST RISK GROUP FOR TUBERCULOSIS IN MASSACHUSETTS.**

TUBERCULOSIS CASES BY PLACE OF BIRTH MASSACHUSETTS 1984-1990



Haitians continue to represent the largest group (21% of the foreign born cases), followed by Cambodians (10%), Vietnamese (9%) - **a 10% increase in cases in Southeast Asians over-all since 1989)**, Cape Verdeans (8%) - a newly emerging high risk group, and Chinese (8%). Cases in persons born in the U.S.S.R. continue to be reported as well as cases from **36 other different countries**, each representing less than 2% of the overall tuberculosis cases for 1990.

MASSACHUSETTS TUBERCULOSIS CASES BY PLACE OF BIRTH* 1990



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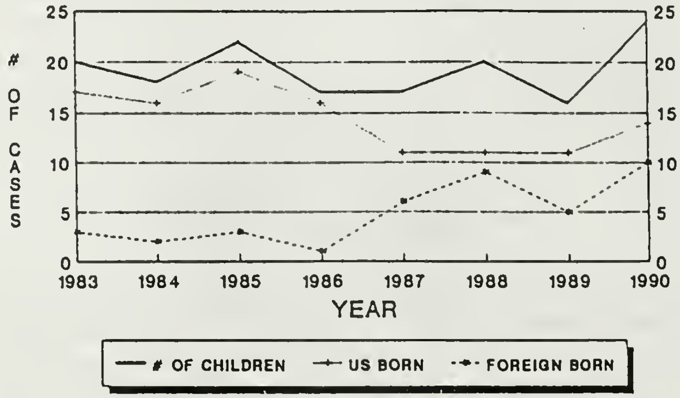
* 2 Unknown place of birth

When cases in children under 15 years of age are analyzed by place of birth, it can be seen that foreign born children comprise 42% of the total cases in this age group.

INCIDENCE OF TUBERCULOSIS CASES IN CHILDREN ‹AGE 15 BY PLACE OF BIRTH MASSACHUSETTS 1983-1990



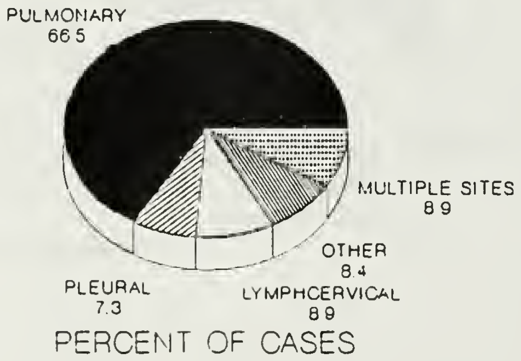
B. CLINICAL CHARACTERISTICS

Pulmonary versus extra-pulmonary - (Appendix 6-7)

Sixty-seven percent of the cases in 1990 were pulmonary (no change from 1989). This was followed by lymph/cervical (8.9%), pleural (7.3%), and numerous other sites, each less than 3%.

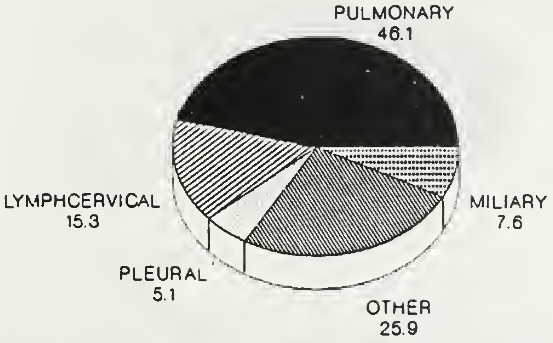
MASSACHUSETTS TUBERCULOSIS CASES BY PRIMARY DISEASE SITE

1990 n=439



When cases with multiple disease sites are analyzed, it is noted that 46.1% had a pulmonary site as their primary site (a 14% decrease since 1989), followed by lymphatic/cervical 15.8% and miliary 7.6%. This increase in extrapulmonary disease is thought to be as a result of the different clinical presentation of TB/HIV cases.

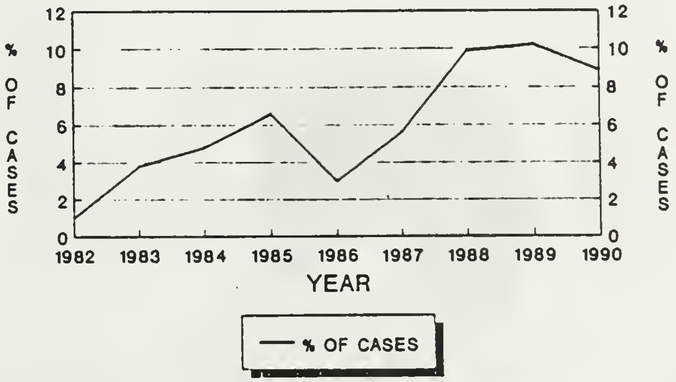
TUBERCULOSIS CASES WITH MULTIPLE
SITES BY PRIMARY SITE
MASSACHUSETTS 1990
(n=39)



PERCENT OF MULTIPLE SITE CASES

Although the percent of cases with multiple sites had been on the rise since 1982, a slight decrease in these cases was noted in 1990.

PERCENT OF TUBERCULOSIS CASES
WITH MULTIPLE SITES
MASSACHUSETTS 1982-1990



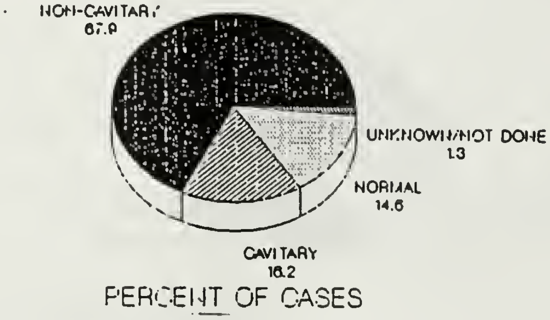
Bacteriologic Confirmation

In 1990, 338 cases (77%) were bacteriologically confirmed. This is a bacteriologically substantiated incidence rate of 5.74/100,000.

Cavitary versus non-cavitary

Sixty-eight percent of the 1990 cases had non-cavitary disease **(AN 11% INCREASE IN 3 YEARS)**, 16.2% were cavitary, 14.6% had normal radiographs, and 1.3% were unknown or had no chest x-ray done. This increase in non-cavitary disease presentations is thought to be assocaited with the different type of pulmonary involvement that is seen in TB/HIV cases.

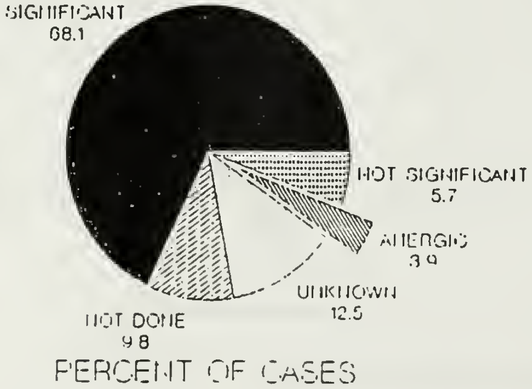
MASSACHUSETTS TUBERCULOSIS CASES
BY X-RAY RESULT
1990 (N=439)



Significant versus non-significant skin tests

Sixty-eight percent of the cases in 1990 had significant skin tests, 13% were unknown, 10% were not done, 6% were non-significant and 3.9% had **documented** anergy. Persons with anergy are increasingly being reported. HIV associated anergy is of significance in TB diagnostic evaluations.

MASSACHUSETTS TUBERCULOSIS
CASES BY SKIN TEST RESULTS
1990 (N=439)



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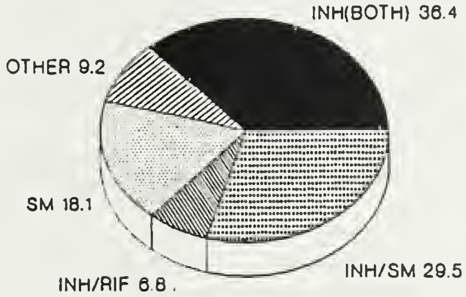
Drug Resistance: (Appendix 8-9)

In 1990, Isoniazid (INH) resistance (both concentrations), accounted for 35% of the drug resistant cases, INH and streptomycin (SM) resistance 30%, INH and rifampin (RIF) 7.5%, streptomycin 20% and other combinations 7.5%.

MASSACHUSETTS TUBERCULOSIS CASES
BY DRUG RESISTANCE
1990 (N=44)*



PERCENT OF CASES

* 2 cases from prior years developed resistance in 1990

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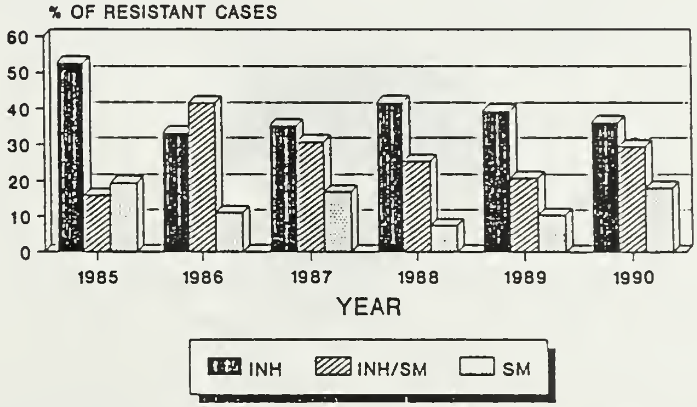
If drug resistant cases are analyzed over time, it can be noted that INH/SM and SM resistance **both increased by 10% since 1989.**

MASSACHUSETTS DRUG RESISTANT
TUBERCULOSIS CASES BY DRUG
1985-1990



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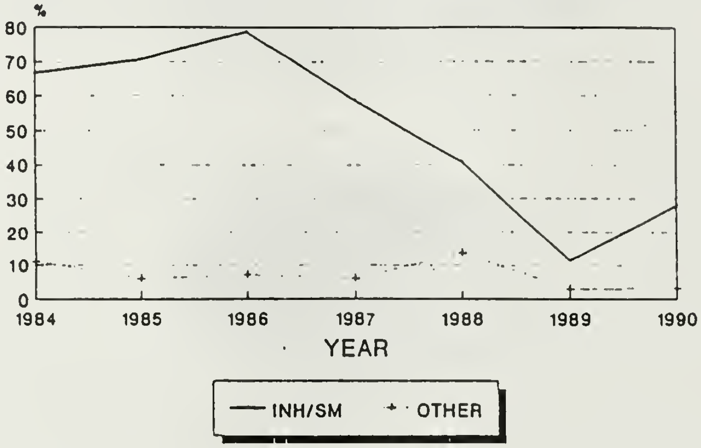
It is of concern that when the homeless drug resistant cases are analyzed for a similar time period, the downward trend in INH/SM cases since the 1984-85 outbreak in this population, is no longer apparent **(A 17% INCREASE SINCE 1989)**.

RATE OF DRUG RESISTANCE AMONG HOMELESS TUBERCULOSIS CASES
MASSACHUSETTS 1984-1990



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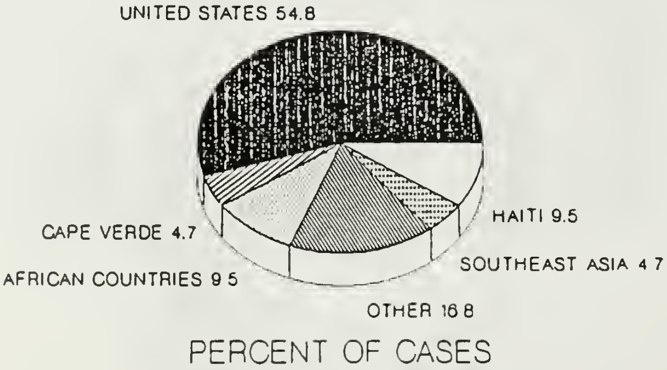
This year, the foreign born account for 45% of the resistant cases overall (a 5% increase from 1989). The greatest percentage of foreign born persons were from Haiti (18%), followed by Vietnam (12%), Cape Verde (12%) and 12 other countries (each under 6%).

MASSACHUSETTS DRUG RESISTANT TUBERCULOSIS CASES BY COUNTRY OF ORIGIN
1990



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Of the remainder of resistant cases with a known etiology, 25% were in the homeless or homeless associated category (**AN 11% INCREASE SINCE 1989**), 7.5% had primary resistance, and 5% were treatment failures.

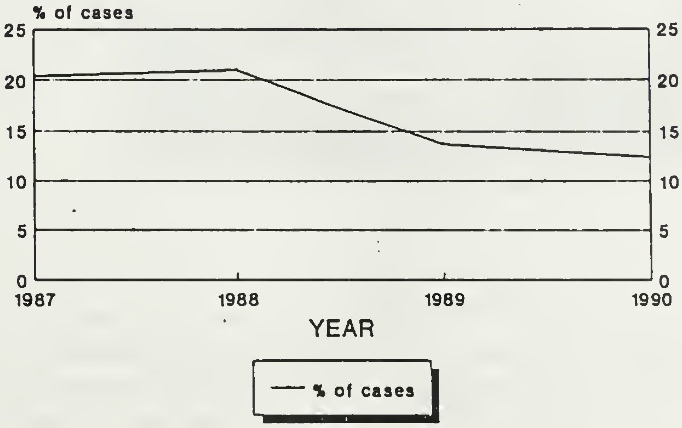
ETIOLOGY OF TB DRUG RESISTANCE
MASSACHUSETTS 1990

ETIOLOGY •	NUMBER OF CASES	PERCENT
HOMELESS/ASSOC.	10	25.0
PRIMARY RESISTANCE	3	7.5
TREATMENT FAILURE	2	5.0
FOREIGN BORN	16	40.0
UNKNOWN	9	22.5
TOTAL	40	100.0

• Cases assigned in descending order of priority

In 1990, the trend of decreasing drug resistance continued. Where drug resistant cases had been increasing since 1987, in 1989, there was a 12% decrease in the number of resistant cases reported and in 1990, an additional 2.5% decrease was noted.

PERCENT OF BACTERIOLOGICALLY CONFIRMED
TB CASES WITH DRUG RESISTANCE
MASSACHUSETTS, 1987-1990



All the drug resistant cases are under current supervision.

C. TUBERCULOSIS IN HIGH RISK GROUPS (Appendix 10)

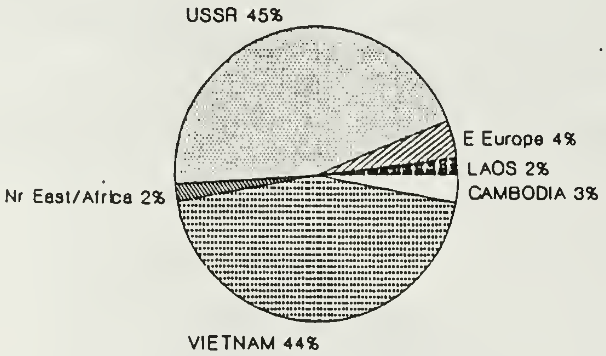
1. THE FOREIGN BORN:

In Massachusetts, there are continuing concerns about specific population groups among whom the incidence of tuberculosis appears to be increasing. Of particular interest to tuberculosis control is the continuing influx of persons from countries where tuberculosis is endemic. The most recent estimate of the total refugee population in the State is 50,000, most of whom are Indochinese. Case rates in refugee and non refugee groups are alarming and the influence of HIV infection has yet to be fully appreciated. Contributing to the problem are the following facts:

* there are increasing numbers of persons (documented and undocumented) arriving from Haiti and Central America.

* Persons from the Soviet Union accounted for almost one half of the refugee arrivals to Massachusetts in 1990. Given that the TB case rate for Eastern Europe is estimated to be 50/100,000, there is the potential for these persons to be at risk for reactivation disease.

1990 REFUGEE ARRIVALS BY COUNTRY OF ORIGIN



N = 4,657

* the number of arrivals to Massachusetts remains high (4,657 refugee arrivals in 1990). This number does NOT include the increasing numbers of Vietnamese immigrant arrivals or persons on parollee status.

* the annual Southeast Asian population growth rate is 12%

* 40% of all refugees screened for tuberculosis have been positive - with a prevalence rate varying from

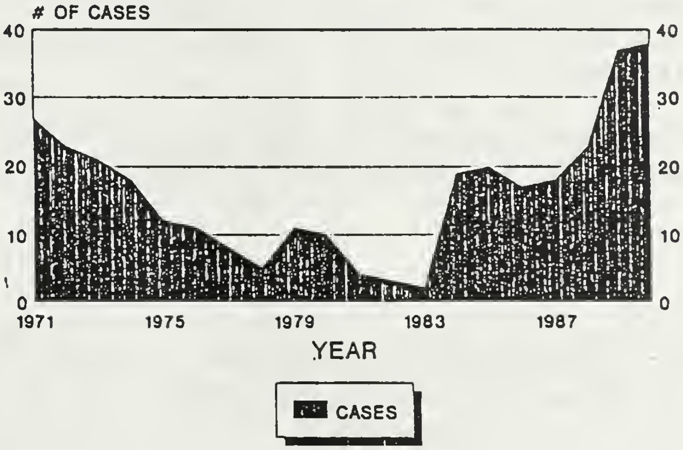
55% to 30% dependant on the ethnic group. This means that we expect approximately 1,600 persons each year who enter the Commonwealth to be already infected with tuberculosis.

- the foreign born account for **45%** of the total drug resistance cases in the State.
- the number of cases among the foreign born has been gradually increasing since 1984. There was a **10% INCREASE IN SOUTHEAST ASIAN CASES ALONE IN 1990**, and a **25% INCREASE IN THESE CASES IN ONLY 2 YEARS.**

2. THE HOMELESS

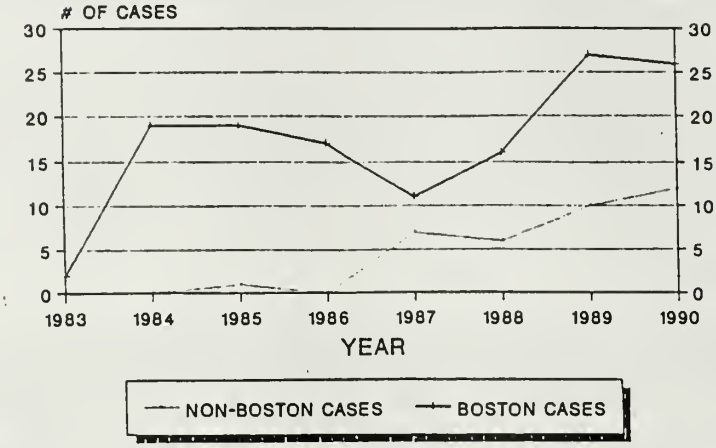
Growing numbers of homeless persons, particularly in Boston, continue to pose tuberculosis control problems. Overcrowding in shelters and the poor nutritional status of clients are contributing factors to the continuation of transmission in this group. It is estimated that there are more than 6,000 homeless in Boston and approximately 23,000 homeless state-wide.

This year, 39 homeless cases were reported (**AN INCREASE OF 66% IN ONLY 2 YEARS**).


TB CASES AMONG THE HOMELESS
MASSACHUSETTS,1971-1990

Sixty-seven percent of these cases were in Boston and 33% were non-Boston (a 6% increase since 1989). Non-Boston cases have been gradually increasing since 1986. Of particular concern is the fact that cases of tuberculosis are now being reported in **FAMILY SHELTERS** - not just shelters for homeless men.

TB CASES AMONG THE HOMELESS
MASSACHUSETTS, 1983 - 1990



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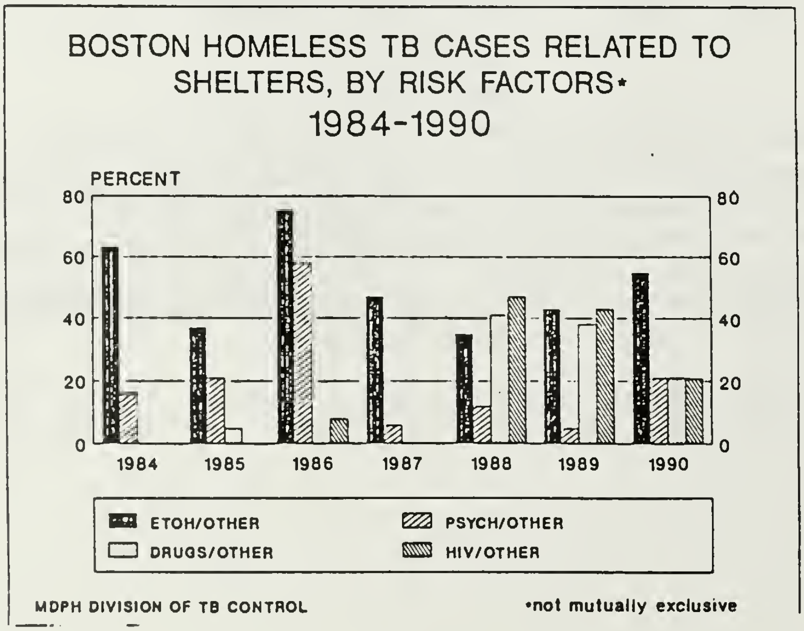
Also of concern is the fact that: 1) rates among persons with psychiatric disorders are increasing; 2) **21% of these cases are reported as being intravenous drug users (IVDUs); and 3) 21% have** documented **positive HIV status. This is presumably only the "tip of the iceberg" as HIV testing is voluntary in Massachusetts. This changing profile of homeless tuberculosis cases is posing very serious prevention and control problems as this group of clients is at greater risk of infection and disease, and they have been noted to be particularly resistant to follow-up.**


BOSTON HOMELESS TB CASES RELATED TO SHELTERS, BY RISK FACTORS*
1984-1990

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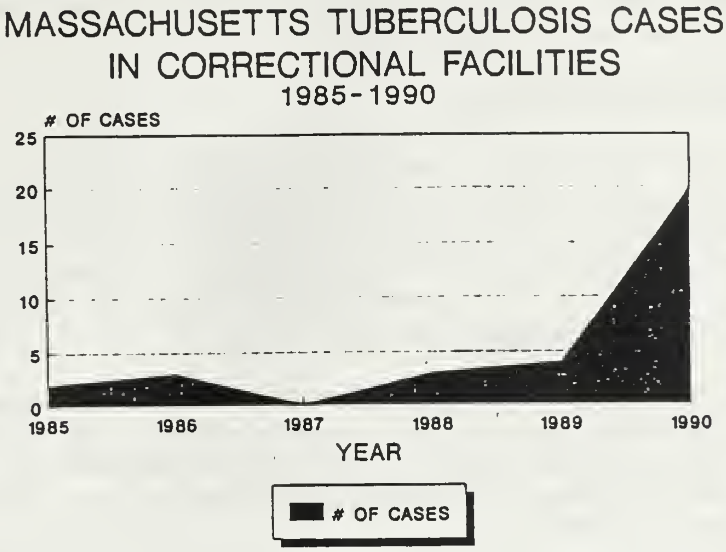
*not mutually exclusive

3. PERSONS IN CORRECTIONAL FACILITIES

This year, there was **A FIVE FOLD INCREASE** in cases reported from correctional facilities in Massachusetts.



An outbreak of tuberculosis with widespread transmission occurred at a prison located in the southeastern part of the State in the late Spring/early Summer. This outbreak led to a massive screening effort (**12,000 PRISONERS AND STAFF**) in the Fall. The increasing numbers of cases from these facilities are the result of the overall changing profile of tuberculosis cases in Massachusetts and the following specifics about the correctional facility setting:

* The increase in the Massachusetts case rate has been noted in the younger age group (20-44 yrs), among IVDU's, among the homeless, and among Hispanics and Blacks. All of these groups are over-represented in the prison population.

* The potential role of HIV infection upon the tuberculosis case rate in Massachusetts prisons is unknown as seroprevalence data is just beginning to be collected in selected correctional facilities, but given the risk groups for HIV infection and TB, it is expected to be a contributing factor.

* Prisons are becoming increasingly overcrowded and given the limited fresh air circulation noted in some buildings, they can potentially be ideal environments for tuberculosis transmission.

4. PERSONS IN LONG TERM CARE FACILITIES

This year, there were 13 cases reported from long term care facilities (no significant change from 1989). Most of these were in nursing homes (7) or other chronic care facilities (4) and 2 cases were reported in nursing home employees.

5. PERSONS INFECTED WITH HIV

Massachusetts has just completed the matching of the Tuberculosis and AIDS Registries for the period of 1982 to December, 1990, and it is clear that the figures are becoming increasingly more alarming. A total of 41 new TB/AIDS cases were added to this register in 1990 (184 matches to date).

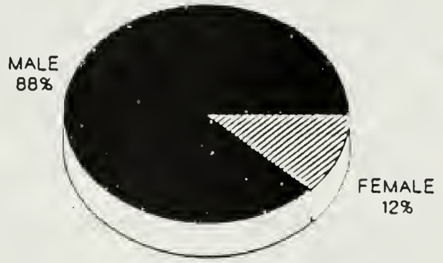
TB/AIDS cases represented 4.8% of the tuberculosis cases. This figure rises with each match and given that both infections are apt to be prevalent in similar risk groups, intensified efforts are needed to control this epidemic.

Demographic analysis of the TB/AIDS cases to date is as follows:

Age and Sex:

Mean age at diagnosis of AIDS for the TB/AIDS cases was 35 years. Eighty-eight percent of the TB/AIDS cases were male and 12% were female.

MASSACHUSETTS TB/AIDS CASES
BY SEX 1982-1990



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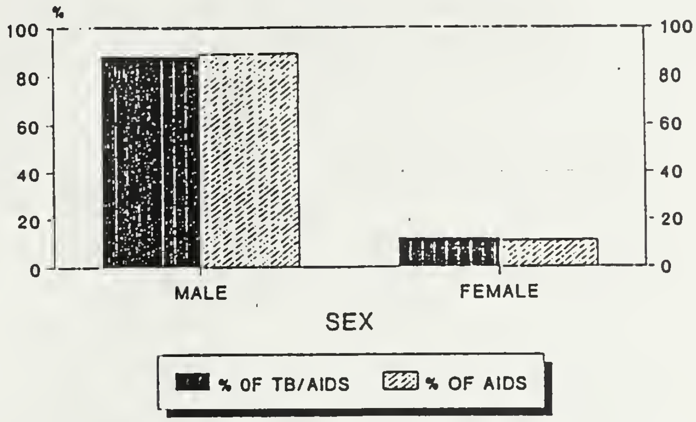
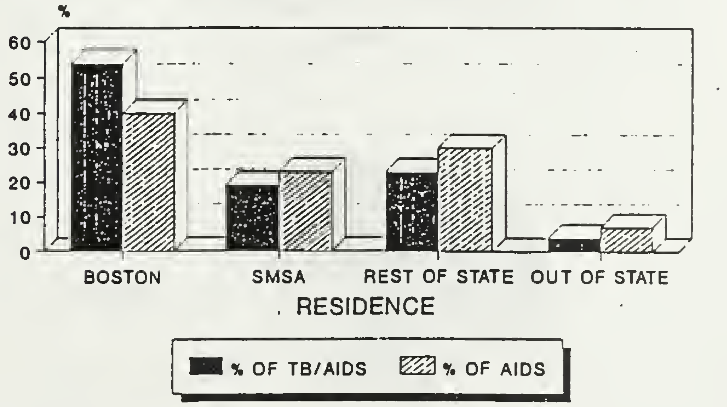
When compared to the AIDS cases alone, slightly more females were noted in the TB/AIDS group than in the AIDS alone.


MASSACHUSETTS TB/AIDS AND AIDS CASES BY SEX 1982-1990

Residence:

Over one half of the TB/AIDS cases (54%) and almost half of the AIDS cases (40%) reside in the City of Boston at the time of diagnosis. The SMSA accounts for an additional 19% and 23% respectively.


MASSACHUSETTS TB/AIDS AND AIDS CASES BY RESIDENCE 1982-1990

MDPH TB/AIDS DIVISIONS

Of those TB/AIDS cases outside of Boston, 9% are from TSA A, 15% are from TSA B, and 14% are from TSA C. Looking at these areas by place of birth of TB/AIDS cases, it can be seen that TSA A and C cases are primarily U.S. born while cases in TSA B, are primarily foreign born.

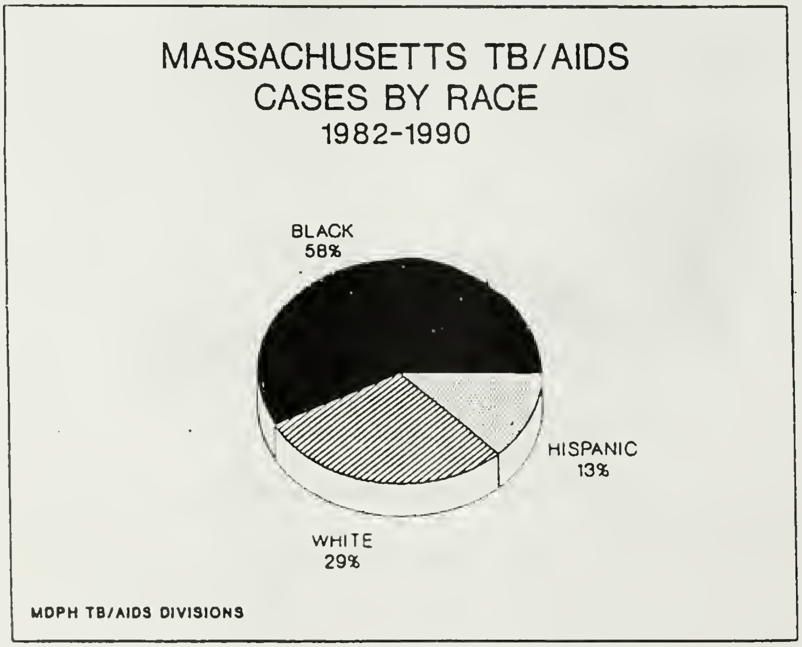
MASSACHUSETTS TB/AIDS BY RESIDENCE AND PLACE OF BIRTH
1982-12/31/90

TSA	TOTAL # (% TOTAL)	PLACE OF BIRTH #US	#FB
• A	17 (9.3)	US-14	FB-2
B	27 (14.8)	US-11	FB-16
C	26 (14.3)	US-24	FB-2
D	99 (54.0)	US-50	FB-49
S	7 (3.8)	US-6	FB-1
Out of State	7 (3.8)	US-7	FB-0
TOTAL	183 (100.0)	US-112	FB-70

• 1 Unknown Place of Birth

Race:

Persons of color have accounted for **71%** of the TB/AIDS cases thus far.

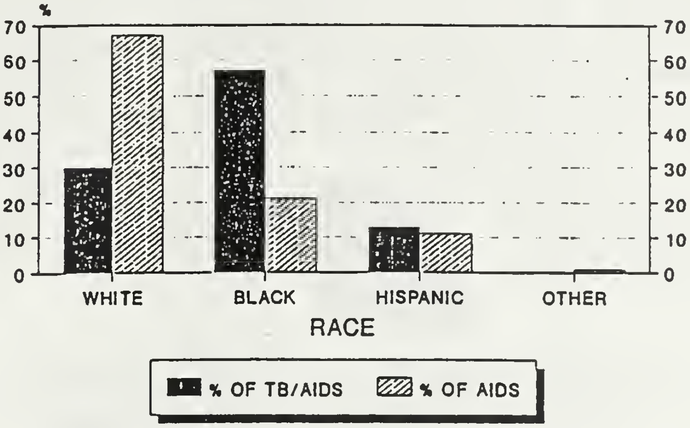


MASSACHUSETTS TB/AIDS CASES BY RACE
1982-1990

MDPH TB/AIDS DIVISIONS

When compared to the AIDS cases in Massachusetts, the proportion of TB/AIDS cases that were black is considerably higher (57% vs. 21%).

MASSACHUSETTS TB/AIDS AND AIDS CASES BY RACE 1982-1990

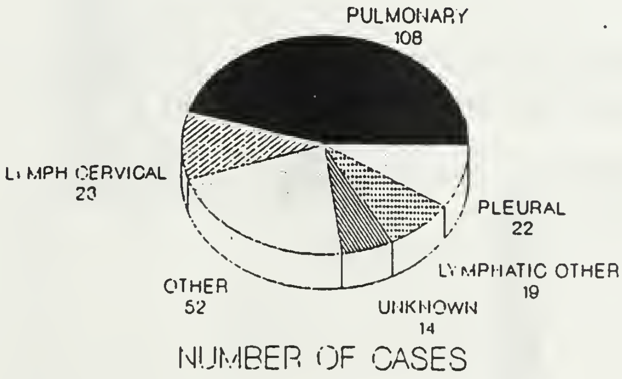


MDPH TB/AIDS DIVISIONS

Disease Site:

Fifty-nine percent of the TB/AIDS cases had a pulmonary site of disease, 23% had lymphatic and 12% had pleural sites. The remainder of the extrapulmonary cases were in other sites, each representing 4% or less of the total TB/AIDS cases.

MASSACHUSETTS TB/AIDS CASES BY TB DISEASE SITE 1982-1990 n=183*



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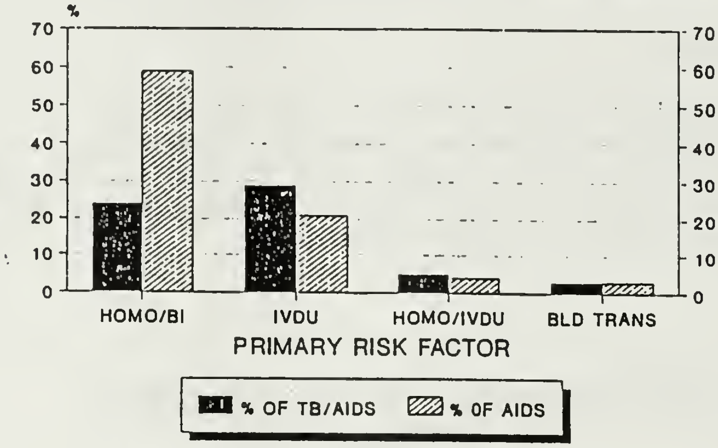
* 48 have multiple sites of TB

Primary Risk Factors:

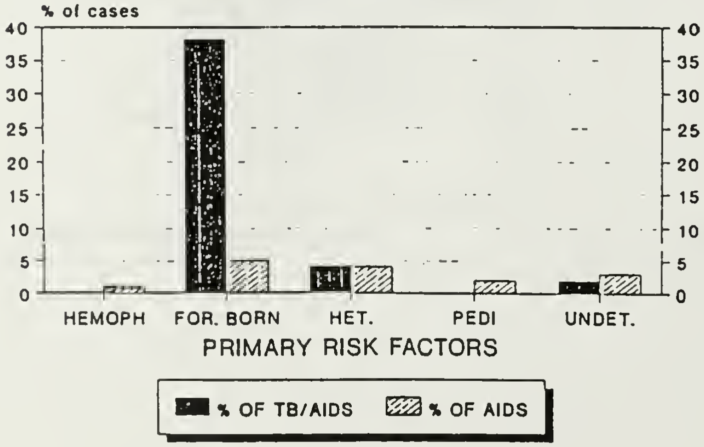
Men who are homosexual or bisexual still account for the majority of the AIDS cases in Massachusetts (59%). Twenty-four percent of the TB/AIDS cases also fall under this category. Of particular interest to the Tuberculosis Program, is the number of TB/AIDS cases among the foreign born (38%) as compared to the number of AIDS cases in that category (5%). It is hypothesized that this apparent risk factor corresponds with the high rates of tuberculosis and HIV infections among Haitians that has been reported elsewhere. In Massachusetts, (as we have shown previously), Haitians account for a high percentage of the tuberculosis foreign born cases. Injectible drug users account for 29% of the TB/AIDS cases and 21% of the AIDS cases.

MASSACHUSETTS TB/AIDS AND AIDS CASES BY PRIMARY RISK FACTORS 1982-1990



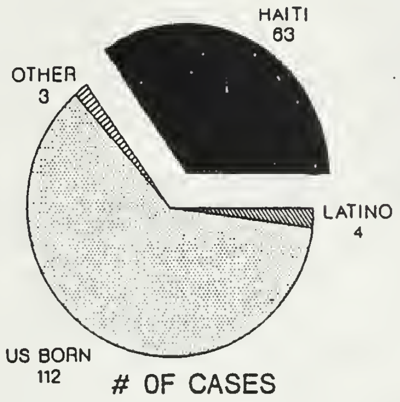
MDPH TB/AIDS DIVISIONS

MASSACHUSETTS TB/AIDS AND AIDS CASES BY PRIMARY RISK FACTORS 1982-1990



Cases of TB/AIDS among IDUs and the foreign born are slowly increasing in the Commonwealth and are expected to account for even greater increases in the future.

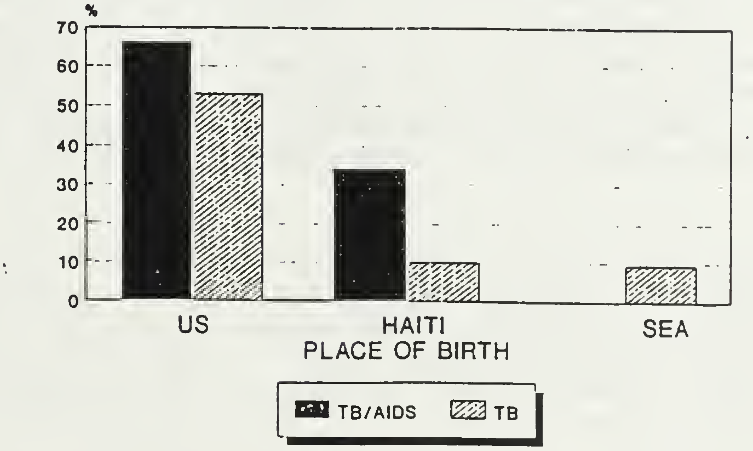
When foreign born TB/AIDS cases are analyzed by place of birth, the majority (90%) are noted to be Haitian. Persons from Latino countries comprise most of the remaining cases in this category.



MASSACHUSETTS TB/AIDS CASES
BY PLACE OF BIRTH *
1982-1990

* 1 Unknown place of birth

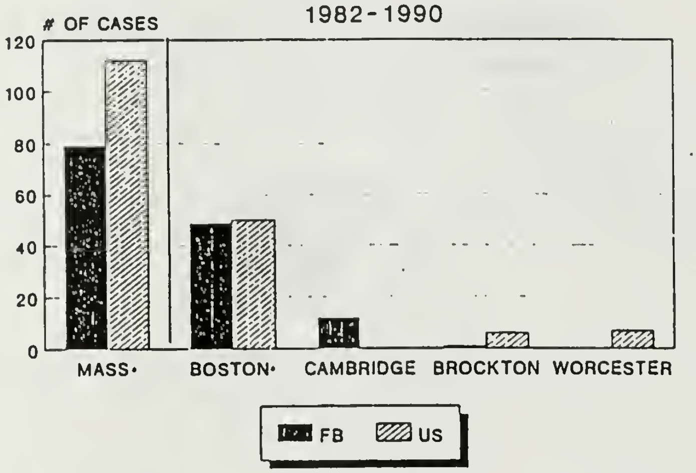
When TB/AIDS and TB cases are compared by place of birth, it is apparent that a much greater percentage of TB/AIDS cases are of Haitian origin.



TB/AIDS CASES, 1982-1990 AND
TB CASES 1990 BY PLACE OF BIRTH

MDPH TB/AIDS DIVISIONS

When the TB/AIDS cases are further analyzed by place of birth and city of report, it can be noted that four cities account for 63% of the TB/AIDS cases and 89% of the total foreign born cases in this category. Of the TB/AIDS cases reported from the City of Cambridge, all have been foreign born.


MASSACHUSETTS TB/AIDS CASES FOR CITIES HAVING >5 CASES BY PLACE OF BIRTH*

MDPH TB/AIDS DIVISIONS

* 1 unknown place of birth

HIV Infection Prevalence:

There is limited data available about HIV infection prevalence in Massachusetts as HIV testing is not a routine procedure in many settings. Exceptions to this are the following:

Voluntary Antibody Testing:

* The Department of Public Health's Sexually Transmitted Disease (STD) Clinics Voluntary Counseling and Testing Program: Data from these clinics indicates that from January 1st to December 31, 1990, an overall seropositivity rate of 5% was found. The greatest rates of seropositivity were noted among males (6%), persons of color (Blacks 7%, Hispanics 5%), men who are homosexual or bisexual (37%), IDUs (16%), homosexual IDU's (20%) and other high risk groups (4%).

* Alternate Test Site seroprevalence data: Data for the period from January 1st to August 31st, 1990, for these sites indicates an overall seroprevalence rate of 6%. The greatest rates of seropositivity were noted in males (8%), persons of color (Blacks 10%, Hispanics 11%), homosexual males (11%), and IDUs (11.%).

* Data from voluntary HIV testing at the Department of Corrections for the period of October to December 1990, indicates an overall seroprevalence rate of 7.6% (males

6.5% and females 12%). Once again, seropositivity rates were highest for IDUs (12%) and persons of color (Blacks 11% and Hispanics 8%).

Blinded Testing:

- Massachusetts is participating in the National Seroprevalence Survey and blinded HIV testing is being done at three State Tuberculosis Clinic sites (Boston, Cambridge and Brockton) as part of this project. Results from Boston from 6/88 to 11/90 among Class III's and V's indicate a **27% seropositivity** rate (88/329) - significantly higher than the cumulative national TB clinic average seroprevalence figure of 3.4% through 1989, and the most recent testing indicates that this percentage will be even higher with the next report . The numbers of samples in this study group from Cambridge and Brockton are too small to allow analysis at this time.

- In addition to the protocol funded by CDC to test only Class III's and V's, the Division has been able to independently analyze data from clients placed on preventive therapy at the Cambridge TB clinic. Of the 190 specimens tested to date, a 0.3% seroprevalence rate has been noted. At the Boston City Hospital site, HIV testing of Class II clients has begun and results from 2/91 to 6/91 indicate a seroprevalence rate of 4.0%.

- Data from blinded testing done at the correctional facilities to date is not yet complete and will not be reported officially for several months.

PART II

DIVISION ACTIVITIES

SERVICE DESCRIPTION

The Division of Tuberculosis Control provides tuberculosis surveillance and control services to all residents of the Commonwealth.

Surveillance program components include: a Case Register system which tracks all TB cases; analysis of reporting trends; matching of the TB and AIDS Case Registries; special screening projects; the deployment of nurses and outreach workers throughout the State for case management, follow-up, and educational services; and the provision of tuberculosis screening and skin testing materials.

Control services include: 30 out-patient clinics located throughout the State which provide diagnostic, treatment and control services to those in need. These services include medical examination, laboratory testing, tuberculosis medications, nursing care and supervision; 10 contracted in-patient facilities for those persons who may need initial acute hospital care; one contracted long term care facility for those persons who require a more structured, intensive prolonged type of care; a respite unit for homeless clients who require interim services; and nurses who are designated to provide "homeless" TB prevention and control activities.

In addition, the Division is the recipient of federal funding for outreach services to designated "high risk" cities and towns, prevention services for substance abusers, TB/AIDS related services and the monitoring of TB medication compliance.

The Department of Public Health provides additional tuberculosis control services via the State Mycobacteriology Laboratory for TB cultures and the Refugee Health Program which provides tuberculosis outreach services to newly arriving refugees.

During 1990, the Division of TB Control began working on the Massachusetts TB Elimination Plan. Activities to date include the following:

A. ADMINISTRATIVE ACTIVITIES:

* Reorganized the TSAs to provide coverage with current resources

* Communication mechanism established with the TB Lab by implementing information sharing meetings

* Participated on the STD RFP review team

* Participated in Bureau planning sessions to strategize provision of future TB clinical services

* Attended training in the State Accounting System (MMARS)

* Hosted a visitor from the World Bank who was referred from CDC to learn about TB Control in the United States.

* Participated on a Bureau Records Management Committee

* Coordinated planning for the first annual Bureau of Communicable Disease Control update seminar "Risk Management and Communicable Disease Control in the 90's" conducted in March, 1991.

* Participated on the Dept. of Public Health's DOC/HIV Advisory Committee

* Attended word processing training

* Participated in the Bureau Journal Club

* Participated on the Bureau committee to implement laboratory reporting of select communicable diseases

* Participated on the American Lung Association of Massachusetts's (ALAM) Lung Disease Guidance Committee and the Boards of the Middlesex, Southeast and Western Massachusetts Lung Associations

B. TB ELIMINATION PROMOTIONAL ACTIVITIES:

1. NATIONAL LEVEL

* Participated in a CDC sponsored TB Elimination Strategy meeting in Atlanta

* Participated in a CDC sponsored working group meeting to discuss anergy issues

* S. Etkind, Division Director was selected as a member of the Advisory Committee for the Elimination of Tuberculosis (ACET)

* Participated on the national committee to establish standards of care for TB nurses

2. LOCAL LEVEL

* Proposed group representation for the Massachusetts Advisory Committee for the Elimination of Tuberculosis presented for comment and suggestions.

* Had one week in May designated as TB Elimination Week in Massachusetts - arranged for press and media attention

* Lobbied the New England Public Health Association to include the TB Elimination Plan in their next annual meeting

* Testified before the Department of Public Health's Public Health Council as to the increasing tuberculosis problem in Massachusetts and the need to continue to provide public health services.

* Presented information on tuberculosis in Massachusetts to an Executive Office of Human Services Task Force of public and private providers who provide services to high risk populations

* Testified before the Joint House-Senate Health Care Committee on the growing tuberculosis problem and the need for continued funding

C. SURVEILLANCE/PREVENTION:

* Continued the monthly meetings with the Boston TB Progam to discuss surveillance and programmatic issues

* Produced the required weekly, monthly and other periodic reports for the Division, CDC, etc.

1. DATA MANAGEMENT

* Installed modems in the field offices

* Connected the TB Case Register computer to the network, allowing access to the TB Lab data

* Revised the TB database code book, expanding the database

* Completed 2 TB/AIDS Registry matches

* Established the Preventive Therapy Registry, and code book revised to reflect the new skin testing guidelines

* Provided D-Base training to the TSA nurses and clerical staff in order to initiate a regionally based surveillance system

* Developed a new contact investigation data system

2. SPECIFIC HIGH RISK GROUP ACTIVITIES:

Health Care Personnel:

* Began to meet with the Dept. of Occupational Hygiene to design a study to analyze the potential risks to health care personnel from aerosolized pentamidine therapy

* Completed and submitted the tuberculosis prevention section of the proposed infection control manual for long term care facilities

Homeless:

- Reevaluated and renewed the contractual agreement for the provision of respite unit beds for homeless persons with TB at the Shattuck shelter
- Evaluated the staff skin testing data at Pine Street Inn as part of the UV light on-going evaluation
- Continued funding for "homeless" designated support staff
- Maintained the "Homeless" database

Substance Abusers/ Drug Treatment Centers:

- Participated on a Substance Abuse Task Force sponsored by MDPH to address concerns of substance abuse service providers for addressing communicable disease issues in IVDU's
- Drafted a TB chapter for the proposed Bureau of Communicable Disease Control manual for substance abuse service providers.
- Drafted an "Implementation Plan for TB Control Services in Drug Treatment Centers"
- Worked with the Division of Substance Abuse to draft a questionnaire for Detox service providers to evaluate their capacity for primary care activities such as TB screening at their sites
- The "HIV-Related TB Prevention Project" was initiated at the New Bedford Area Center and the selected Boston methadone maintenance sites. Preliminary results have been obtained and INH and methadone dosing are being done concurrently. The data management system is currently being implemented. Supplemental funding has allowed expansion of this project to the Elm Street Center in Holyoke and implementation is in progress at this site.
- Participated in the HIV-Related TB Prevention Project workshop at CDC.

Persons in Correctional Facilities:

- Completed a massive screening of all 8,000 **inmates and 4,000 staff** at DOC correctional facilities statewide following an outbreak at one site
- Worked with the Dept. of Corrections to provide TB testing and follow-up protocols for their facilities
- Made site visits to all DOC facilities

* Developed a Dept. of Public Health data tracking system for TB cases and suspects in correctional facilities

* Assisted the DOC Data Management staff in setting up a prison system wide database specific for TB screening and followup data on both inmates and staff.

* Began prison site visits to evaluate ventilation, UV, isolation capacity and other methods currently in use to prevent potential transmission of tuberculosis.

Children:

* Completed and submitted to the Office for Children, recommendations for screening in day care facilities

Persons at risk for HIV/TB Co-infection:

* Participated on the Seroprevalence Committee

* Continued the HIV blinded seroprevalence survey at a total of 3 TB clinic sites

* Worked with the AIDS Behavior Reinforcement Program to evaluate the followup results after providing TB/HIV information to clients attending their sites

* Worked with the AIDS Program to provide TB input into the CDC/AIDS Cooperative Agreement application

* Worked with the AIDS Program to provide HIV counseling and testing services at select TB clinics

* Continued the TB/STD/HIV working group to try to devise methods to do TB skin testing or referrals at STD Clinic sites

3. OUTBREAK CONTROL ACTIVITIES

* Investigated 2 outbreaks of tuberculosis, one in a western Mass community and the other in a prison setting

D. CONTAINMENT:

1. OUTPATIENT SERVICES

* Site visits were made to several clinics with the Bureau Director, Dr. DeMaria

* Addressed clinic issues at Salem, Taunton, Pittsfield, Holyoke, Mass General, Brockton, St. Vincent's, Barnstable , Milford and Shattuck

* Established a pilot project clinic at the Revere Health Center

* Worked with the Rate Setting Commission to establish new rates for services provided

* Revised the policies for approved laboratory/ special diagnostic tests, clinic eligibility, priorities and types of visits

* the "Compliance with TB Therapy Study" was awarded to the Division and client enrollment is complete at 10 TB Clinic sites

* Established a non-financial agreement for TB services at the Mass General Hospital

* Based on current CDC and AAP recommendations, the Division discontinued the provision of Tine tests

* Completed a general TB drug usage analysis including cost and inventory data

* Based on the above information, budget shortfalls and increasing TB drug costs, the Division began a system of monthly TB drug inventories from each clinic site

* Mailed reimbursement mechanism policy reminder letters to all clinic staff and billing departments

* Established a pilot "Communicable Disease Control Clinic" at the Berkshire Medical Center. This clinic provides combined TB, STD and HIV related services to this geographically remote region

* Continued work on revising and upgrading TB regulations

* Began planning for a TB Clinic RFP process

* Worked with the MDPH Purchase of Service Office and the State Purchasing Office to review bids for this year's TB drug contracts

2. INPATIENT SERVICES

* Worked with Middlesex County Hospital on security, discharge planning, social service, court commitments and third party reimbursement issues

* Completed planning to move the Division's long term care referral site to the Shattuck Hospital and transitioned services from our current facility. Official opening of the new unit was on 12/21/90.

* Escorted representatives from the New York City TB Control Program on a tour through our long term care facility

* Established an in-patient database tracking system

* Processed legal papers to hospitalize 8 non-compliant patients

E. EDUCATIONAL:

1. MAILINGS

* Conducted periodic mailings to all TB clinic staff

* Wrote and distributed 2 Public Health Alerts on TB/HIV: the Connection, and the new skin testing guidelines

* Distributed materials from the Advisory Committee for the Elimination of Tuberculosis and CDC to various designated groups

2. MATERIAL DEVELOPMENT

* Acted as consultants to Channing Bete in the development of their pamphlet on TB.

* Assisted with the completion, translation into french and spanish, and the distribution of the preventive therapy video

* Reviewed the CDC proposed TB booklet for inmates of correctional facilities

3. TRAINING/ LECTURES

* Began training outreach workers to do skin tests

* The 4th Annual "Ted" Badger TB conference on "TB in the Foreign Born" was held with over 200 persons attending

* Provided 38 inservices on TB and TB/HIV to groups such as the Mass. Assoc. of Health Boards, Mass. Health Officers Assoc., Mass. Nurses Assoc., etc.

* Participated in Grand Rounds at the Mass General Hospital

* Conducted several inservices on TB/HIV for the AIDS staff

* Participated in the Western Mass ALA, Central Mass ALA, Southeastern Mass ALA and ALA Massachusetts TB symposiums

* Lectured at the following colleges: Tufts and the Harvard School of Public Health to the MPH/MD students and Northeastern University to the Nursing students

* Conducted a TB/HIV and TB Elimination inservice for the Massachusetts Centers for Disease Control staff

- Conducted 3 inservices for the Plymouth County House of Correction staff

- Conducted inservice education for all 4,000 Department of Correction staff and 8,000 inmates

- Submitted a proposal (with the ALAM and MTS) for an expanded Ted Badger TB conference next year

4. MEDIA/ PUBLIC RELATIONS

- Provided TB information for the following:

Newspapers	- Boston Globe, Middlesex News
Radio	- WVBF (1/2 hr. interview)
TV	- Channel 56 (2 parts)
	Channel 3
	Channel 5

5. ABSTRACTS/PAPERS PRESENTED

- Indiana Annual TB Conference (S. Etkind) "TB and the Homeless"

- Massachusetts Thoracic Society Annual Meeting (E. Nardell) "INH Debate"

- Beth Israel Hospital Centennial Symposium, New York City, (E. Nardell) "TB Resurgence"

- CDC "Prevention 90" Conference, (E. Nardell) "TB and Homelessness"

- 1990 World Congress on Lung Health, Boston:

  "The Tuberculosis "Menace" Patient: A Dramatically Changing Profile" (S. Etkind, et al)

  Symposium: Airborne Infection Control Strategies (E. Nardell)

  Symposium: Prevention of Respiratory Infections (E. Nardell)

- Annual NorthEast Epidemiology Conference, (S. Etkind and J. Boutotte) Latebreaker - TB Outbreak in a Massachusetts Prison

- ACCP Annual Meeting, Symposium - Respiratory Infections (E. Nardell)

6. ABSTRACTS SUBMITTED

* American Public Health Association Annual Conference

" Funding for Tuberculosis Care for the Homeless: Is it a Priority?" (S. Etkind, et al.)

* American Thoracic Society/ALA 1991 Annual Meeting

" Widespread TB Transmission within a Prison and Screening of the Entire Prison Population" (S. Etkind, et al.)

" HIV Seroprevalence in an Asymptomatic, PPD+, Class II, Predominantly Non-white, Foreign Born Inner City TB Clinic Population" (E. Nardell, et al.)

7. ARTICLES PUBLISHED

* "Tuberculosis Infection in Urban Adolescents: Results of a School-Based Testing Program" in the American Journal of Public Health, April, 1990 (A. Barry, S. Etkind, et al.)

* "Dodging Droplet Nuclei: Reducing the Probability of Nosocomial Tuberculosis Transmission in the AIDS Era" Editorial for the American Review of Respiratory Diseases, September, 1990 (E. Nardell)

8. ARTICLES ACCEPTED FOR PUBLICATION

* "Airborne Infection: the Theorectical Limits of Protection Achievable by Building Ventilation" (E. Nardell, et al) for the American Review of Respiratory Diseases

PART III

EVALUATION/ PROGRAM REVIEW

A. EVALUATION ACTIVITIES

* Completed the ASTHO Report summarizing TB activities and the associated cost

* Completed the CDC Program Management Reports which analyze case, contact and preventive activities

* Completed the "07" Performance Evaluation Activity Report which analyses all contracted services (clinics, inpatient, grant recipients, etc.)

* Completed the 6 month progress and annual reviews of Division goals and objectives

* Completed the review of TB clients accessing services via the "SLIAG" (amnesty) mandate

* Completed the 1990 Annual Report

B. CDC PROGRAM REVIEW REPORTS

1. OBJECTIVES

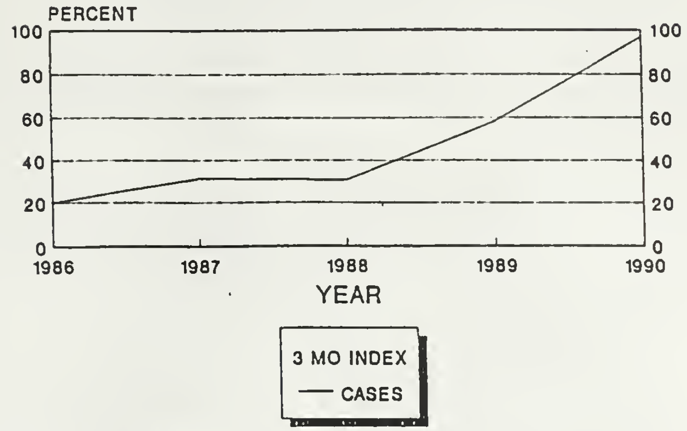
Objective 1:

At least 90 percent of all initially infectious patients will become noninfectious (convert their sputum from positive to negative) within three months of starting treatment.

(Sputum Conversion Report:

Data (excluding Boston) for the period of January 1, 1990, to June 30, 1990, indicate that an average of 97 percent of all initially infectious patients converted their sputum from positive to negative within three months of starting treatment (excluding those persons who did not have a sputum done). **THIS OBJECTIVE HAS BEEN REACHED.** The Division of Tuberculosis Control is continuing to perform a needs assessment and evaluation of our clinic system in preparation for the Request for Proposal process which has been delayed until FY 1993. Part of this process includes drafting Divisional TB Clinic Guidelines and policies. An initial draft has been completed and it includes very specific directions for clinic monitoring of sputum status and quality assurance reviews of these clinic practices to be conducted periodically by our Divisional staff.

MASSACHUSETTS SPUTUM CONVERSION
REPORT (EXCLUDING BOSTON)
1986-6/90

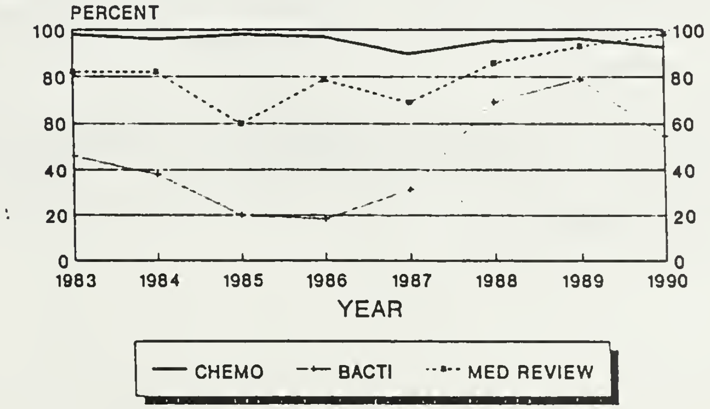


MDPH DIVISION OF TB CONTROL

Objective 2

At least 90% of patients for whom two or more drugs are recommended will be on current chemotherapy. (Case Register Report) The report for the period of January 1,1990 to June 31, 1990, indicates that 92.3 percent of tuberculosis patients for whom two or more drugs were recommended, were on current chemotherapy, indicating that **THIS OBJECTIVE HAS BEEN ACHIEVED** for the Commonwealth, excluding Boston. This objective has been consistently achieved since the original awarding of the Cooperative Agreement.

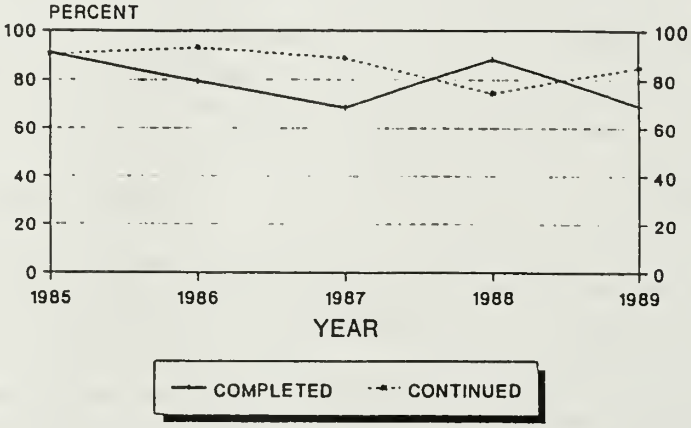
MASSACHUSETTS CASE REGISTER
REPORT (EXCLUDING BOSTON)
1986-6/90



MDPH DIVISION OF TB CONTROL

At least 90 percent of newly reported cases will complete an American Thoracic Society/ Centers for Disease Control (ATS/CDC) recommended regimen of antituberculosis drug therapy. (Drug Therapy Report). Data for Massachusetts, excluding Boston, for the period of January 1 to December 31, 1989, indicate that 85 percent of the cases continued on therapy for the initial 6 month period. Sixty-nine percent of the persons starting therapy completed a recommended course of treatment within 12 months.

MASSACHUSETTS DRUG THERAPY
REPORT (EXCLUDING BOSTON)
1985-1989

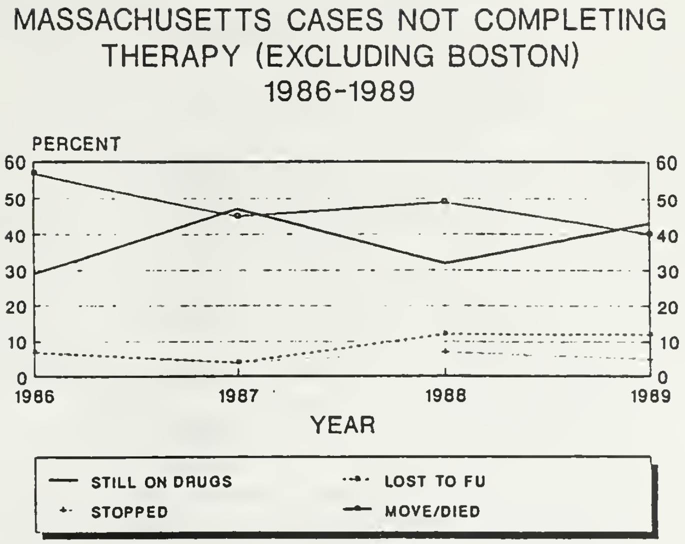


MDPH DIVISION OF TB CONTROL

Forty-nine percent of those cases not completing therapy were still on medications (22.5% of these have since completed therapy). Of those cases still on medication, 27% are drug resistant cases still on medication for prescribed regimens requiring more than 12 months of treatment.

The reasons for non-completion of a recommended course of therapy within 12 months in the remainder of cases, are as follows: 23.5% died, 16.5% moved - records were referred, 12% were lost to follow up, and 5% stopped taking drugs for a variety of reasons.

It is clear that if we exclude those categories over which the Division has little control (died, moved, drug resistance, etc.), then 93% of the cases actually completed therapy and **THIS OBJECTIVE HAS BEEN MET.**



MDPH DIVISION OF TB CONTROL

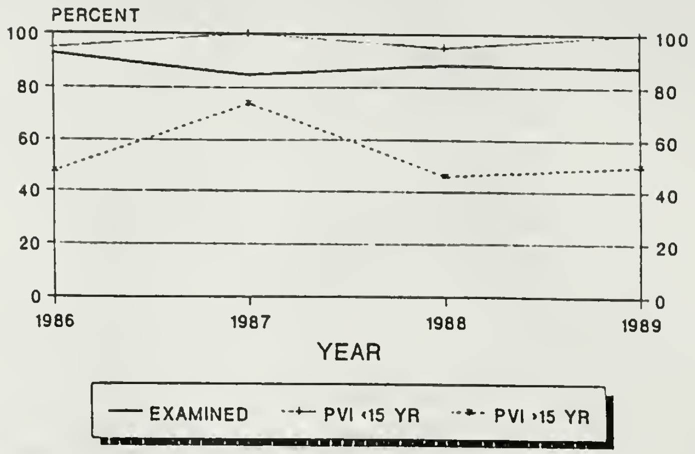
Objective 3:

At least 95 percent of close contacts to infectious cases will receive examinations, with at least 95 percent of infected contacts under 15 years of age and 75 percent of infected contacts 15 years of age and over placed on preventive treatment.

(Program Management Report: Contact and other infected persons under supervision)
This report indicates that 91.2 percent of close contacts to infectious cases who were identified were examined so that **THIS PART OF OBJECTIVE 3 HAS BEEN NEARLY MET.**

Of infected contacts under 15 years of age, 100 percent were placed on preventive therapy. **THIS PART OF THE OBJECTIVE HAS BEEN EXCEEDED.**

Of infected contacts over 15 years of age, 50.2 percent were placed on preventive therapy, indicating that THIS PART OF THE OBJECTIVE NEEDS FURTHER EVALUATION.



MASSACHUSETTS CONTACT AND OTHER INFECTED PERSONS REPORT (EXCLUDING BOSTON) 1986-1989

MDPH DIVISION OF TB CONTROL

A new reporting system has been developed for tracking contacts and it is expected that further progress will be made with this objective once the system is fully implemented.

Objective 4:

For infected contacts under the age of 15 placed on preventive therapy, at least 90 percent will complete a minimum of 6 continuous months of preventive therapy. For contacts 15 years of age and older and other high risk persons of any age started on preventive therapy, at least 75% will complete a minimum of 6 continous months of preventive therapy.

Completion of Preventive Therapy Report:

Our report for the period of January 1 to December 31, 1989, indicates that 39% of infected contacts under 15 years of age completed preventive therapy, indicating that THIS PART OF THE OBJECTIVE NEEDS FURTHER EVALUATION. For infected contacts over the age of 15 years, an average of 38.9% completed preventive therapy, indicating that THIS PART OF THE OBJECTIVE ALSO NEEDS FURTHER EVALUATION. This is the first time that this report has been generated using the new Preventive Registry system and, as with any new system, "bugs" and computer entry problems became evident when we ran this report for the first time. Unfortunately, due to lack of resources and other higher priorities, we will be unable to complete a Preventive Report (either by computer or by hand) in the future.

MASSACHUSETTS PREVENTIVE REPORT (EXCLUDING BOSTON)

	CONTACTS			CONVERTER	OTHER
	‹15 YRS	15-35 YRS	35+		
1986	76.3%	54.8%	60.4%	84.4%	56.8%
1987	90.3%	45.2%	51.7%	56.1%	44.3%
1988	74.5%	44.4%	43.4%	32.6%	54.0%
1989	39.0%	34.5%	43.3%	29.3%	30.2%

MDPH DIVISION OF TB CONTROL

APPENDICES

APPENDICES

1. High Risk city List
2. Case Rates by Community
3. Age/Sex Table
4. Age/ Race/ Ethnicity Table
5. Place of Birth List
6. Disease Site List
7. Multiple Site List
8. Drug Resistance List
9. Drug Resistance by Place of Birth List
10. High Risk Group List

Appendix 1

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC HEALTH
DIVISION OF TUBERCULOSIS CONTROL

Seven-Year Mean for Cities* With Above Average Case Rates
Tuberculosis Case Rates (per 100,000 population) for 1984-1990

CITY	1990	1989	1988	1987	1986	1985	1984	MEAN
ARLINGTON	9.36	13.86	8.70	8.66	0.00	19.72	19.72	11.43
BOSTON	25.95	24.77	24.95	24.21	24.71	26.98	22.20	24.82
BROCKTON	21.66	10.30	15.15	12.16	13.56	4.17	2.10	11.30
BROOKLINE	0.00	5.70	11.28	7.52	13.13	7.50	5.45	7.23
CAMBRIDGE	15.87	28.11	10.75	19.27	15.13	24.86	15.74	18.53
CHELSEA	15.77	15.56	16.06	16.10	11.51	19.19	7.86	14.58
FITCHBURG	17.85	22.92	15.79	13.19	13.18	7.55	5.05	13.65
FRAMINGHAM	11.00	15.68	9.26	7.77	4.66	3.08	9.21	8.67
HOLYOKE	9.64	7.17	7.04	23.50	6.96	0.00	13.50	9.69
LAWRENCE	9.59	6.38	6.50	9.76	7.76	7.76	7.91	7.95
LEOMINSTER	5.68	19.91	2.85	11.40	17.10	2.89	11.59	10.20
LOWELL	15.95	12.78	13.98	10.75	18.19	14.98	9.74	13.77
LYNN	16.63	5.11	5.24	21.00	11.35	10.09	11.47	11.56
NEW BEDFORD	11.39	12.40	6.22	10.36	11.25	12.28	15.23	11.30
REVERE	11.29	15.86	9.63	7.23	12.04	4.64	7.10	9.68
SOMERVILLE	7.01	15.29	13.33	17.28	10.55	7.91	6.46	11.12
SPRINGFIELD	8.94	6.84	11.86	6.81	11.30	13.29	5.25	9.18
WORCESTER	7.76	10.29	6.41	5.77	8.33	6.88	4.94	7.20
TATE AVERAGE ASE RATE FOR EAR	7.45	7.16	6.66	6.92	7.38	7.88	6.55	7.14

Arlington and Brookline are towns, not cities

Number of Tuberculosis Cases for Boston, 17 High-Risk Cities/Towns, and Remainder of Towns Reporting Cases For 1984-1980 and Seven Year Average

CITY/TOWNS	1990	1989	1988	1987	1986	1985	1984	7-Y ave
				----number of cases----				
BOSTON	149	142	132	126	141	154	125	13
PERCENT OF STATE	34%	34%	35%	32%	33%	34%	33%	33
				----number of cases----				
ARLINGTON	4	6	4	4	0	9	9	5
BROCKTON	21	10	15	12	13	4	2	11
BROOKLINE	0	3	6	4	7	4	3	4
CAMBRIDGE	14	25	10	19	14	23	15	17
CHELSEA	5	4	4	4	3	5	2	4
FITCHBURG	7	9	6	5	5	3	2	5
FRAMINGHAM	7	10	5	5	3	2	6	5
HOLYOKE	4	3	3	10	3	0	6	4
LAWRENCE	6	4	4	6	5	5	5	5
LEOMINSTER	2	7	1	4	6	1	4	4
LOWELL	15	12	13	10	17	14	9	13
LYNN	13	4	4	16	9	8	9	9
NEW BEDFORD	11	12	6	10	11	12	15	11
REVERE	5	7	4	6	3	10	3	5
SOMERVILLE	5	11	10	13	8	6	5	8
SPRINGFIELD	13	10	17	10	17	20	8	14
WORCESTER	12	16	10	9	13	11	8	11
TOTAL THESE 17 CITIES/ TOWNS	144	153	122	147	137	137	111	136
% OF STATE	33%	35%	32%	37%	31%	31%	29%	33%
TOTAL CASES 333 REMAINING CITIES/TOWNS	146	126	128	123	150	166	140	140
% OF STATE	33%	30%	33%	31%	35%	36%	37%	34%
TOTAL CASES IN STATE	439	421	382	396	428	457	376	414

Appendix 2

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
BARNSTABLE				
	Barnstable	2	5.00	-
	Bourne	1	5.84	-
	Truro	1	66.31	-
BERKSHIRE				
	Pittsfield	1	2.05	-

* Only communities with › 3 ranked

MDPH TB DIVISION OF TB CONTROL

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RAtES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
BRISTOL	Attleboro	7	19.73	4
	Fall River	5	5.60	24
	Mansfield	1	6.57	-
	New Bedford	11	11.39	12
	North Attleboro	1	3.89	-
	Somerset	1	5.57	-
DUKE		-	-	-

*Only communities with › 3 ranked

MDPH DIVISION OF TB CONTROL

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
ESSEX				
	Andover	1	3.69	-
	Beverly	1	2.77	-
	Gloucester	2	7.11	-
	Haverhill	3	6.12	23
	Lawrence	6	9.59	16
	Lynn	13	16.63	8
	Methuen	3	7.37	20
	Newbury	1	17.53	-
	Salem	2	5.33	-
	Saugus	1	3.84	-
FRANKLIN				
	Greenfield	3	17.06	6
	Montague	2	24.69	-
	Shutesbury	1	74.91	-
	Sunderland	1	33.44	-

*Only communities with › 3 cases ranked

MDPH DIVISION OF TB CONTROL

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
HAMPDEN				
	Agawam	1	3.66	-
	Chicopee	3	5.29	26
	Holyoke	4	9.64	15
	Longmeadow	1	6.14	-
	Ludlow	2	10.66	-
	Palmer	1	8.40	-
	Springfield	13	8.94	18
	Westfield	2	5.27	-
	W Springfield	2	7.51	-
HAMPSHIRE				
	Amherst	2	5.94	-
	Hadley	1	23.23	-
	Easthampton	1	5.87	-

*Only communities with › 3 ranked

MDPH DIVISION OF TB CONTROL

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
MIDDLESEX				
	Arlington	4	9.36	18
	Belmont	1	4.11	-
	Burlington	1	4.42	-
	Cambridge	14	15.87	10
	Chelmsford	1	3.15	-
	Dracut	1	3.94	-
	Everett	2	5.57	-
	Framingham	7	11.00	14
	Hudson	3	16.76	7
	Lowell	15	15.95	9
	Malden	5	9.39	17
	Marlboro	1	3.22	-
	Maynard	1	10.03	-
	Medford	3	5.33	25
	Melrose	2	7.15	-
	Newton	3	3.69	27
	Somerville	5	7.01	22
	Waltham	4	7.04	21
	Wakefield	1	3.99	-
	Waterown	2	6.13	-
	Wayland	1	8.30	-
	Wilmington	1	5.73	-

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*Only communities with › 3 ranked

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
NORFOLK	Braintree	4	11.53	-
	Dedham	1	4.36	-
	Milton	1	3.94	-
	Quincy	3	3.69	27
	Sharon	1	6.64	-
	Stoughton	2	7.31	-
	Wellesley	2	7.54	-
	Weymouth	1	1.84	-
	Walpole	1	4.87	-
PLYMOUTH				
	Brockton	21	21.66	3
	Marion	1	22.80	-
	Plymouth	1	2.30	-

Only communities with › 3 cases ranked

MDPH DIVISION OF TB CONTROL

1990 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
SUFFOLK				
	Boston	149	25.95	1
	Chelsea	5	15.77	11
	Revere	5	11.28	13
	Winthrop	5	26.72	2
WORCESTER				
	Athol	1	9.21	-
	Auburn	2	14.05	-
	Dudley	2	22.21	-
	Fitchburg	7	17.85	5
	Grafton	1	8.21	-
	Leominster	2	5.68	-
	Millbury	1	8.50	-
	Northbridge	1	8.00	-
	Paxton	1	26.09	-
	Shrewsbury	1	4.41	-
	Southbridge	2	6.10	-
	Worcester	12	7.76	19
	Warren	1	24.86	-
	Webster	1	6.60	-

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*Only communities with › 3 cases ranked

Appendix 3

MASSACHUSETTS 1990
TUBERCULOSIS CASES BY AGE AND SEX

AGE	MALE CASES	MALE PERCENT	FEMALE CASES	FEMALE PERCENT	TOTAL CASES	TOTAL PERCENT
<1 - 04	6	1.4	8	1.8	14	3.2
5 - 09	3	.7	3	.7	6	1.4
10 - 14	1	.2	3	.7	4	.9
15 - 19	7	1.6	8	1.8	15	3.4
20 - 29	49	11.2	36	8.2	85	19.4
30 - 39	75	17.1	32	7.3	107	24.4
40 - 49	52	11.8	7	1.6	59	13.4
50 - 59	20	4.5	18	4.2	38	8.7
60+	64	14.5	47	10.7	111	25.2
TOTAL	277	63.0	162	37.0	439	100.0

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Appendix 4

1990 VERIFIED TUBERCULOSIS CASES

AGE, RACE, SEX DISTRIBUTION

Age	White not Hispanic		Black not Hispanic		Hispanic		Asian Pacific Islander		American Indian		Not Specified		TOTAL		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	BOTH
0-4	2	2	1	3	1	1	0	2					4	8	12
5-9	0	0	0	1	2	2	1	0					3	3	6
10-14	1	1	0	1	1	0	0	1					2	3	5
15-19	2	2	1	2	1	0	3	4					7	8	15
20-24	1	2	9	4	4	5	6	2					20	13	33
25-29	11	4	9	9	2	3	7	7					29	23	52
30-34	12	7	11	6	4	1	5	3	3				35	17	52
35-39	12	4	16	7	9	0	4	4					41	15	56
40-44	6	0	8	1	8	0	3	2					25	3	28
45-54	22	9	8	4	3	1	5	1					38	15	53
55-64	14	4	4	2	0	0	2	4		1			20	11	31
65-	36	27	10	9	2	2	5	5					53	43	96
TOTAL	119	62	77	49	37	15	41	35	3	1			277	163	439

MASSACHUSETTS 1990 TUBERCULOSIS CASES BY PLACE OF BIRTH

COUNTRY	NUMBER	PERCENT
UNITED STATES	234	53.3
HAITI	44	10.0
CAMBODIA	21	4.8
VIETNAM	19	4.3
CAPE VERDE	17	3.9
CHINA	17	3.9
DOMINICAN REPUBLIC	7	1.6
ITALY	5	1.1
35 OTHER COUNTRIES	66	15.0
UNKNOWN	2	0.5
TOTAL	439	100.0

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MASSACHUSETTS 1990 TUBERCULOSIS CASES BY PRIMARY DISEASE SITE

SITE	NUMBER OF CASES	PERCENT
Pulmonary	292	66.5
Lymphcervical	39	8.9
Pleural	32	7.3
Bone and/or Joint	5	1.1
Genitourinary	9	2.1
Lymphother	3	0.7
Miliary	4	0.9
Other Site	16	3.6
Multiple Sites	39	8.9
TOTAL	439	100.0

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TUBERCULOSIS CASES WITH MULTIPLE SITES
MASSACHUSETTS 1990

PRIMARY SITE	NUMBER	PERCENT
Pulmonary	18	46.1
Lymphcervical	6	15.3
Miliary	3	7.6
Pleural	2	5.1
Lymphother	2	5.1
Bonjoi	1	2.6
Brain	1	2.6
GI	1	2.6
Liver	1	2.6
Men	1	2.6
Pericardial	1	2.6
Peritoneal	1	2.6
Spleen	1	2.6
TOTAL	39	100.0

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Appendix 8

TUBERCULOSIS DRUG RESISTANCE DATA
MASSACHUSETTS 1990

MEDICATION (DOSE)	# CASES	PERCENT
INH (.2) (1.0)	9	20.5
INH (.2) (1.0)/SM	12	27.2
SM	8	18.1
INH (.2)	7	15.9
INH (.2) (1.0)/RIF	3	6.8
RIF	1	2.3
INH (.2)/SM	1	2.3
INH (.2) (1.0)/EMB	1	2.3
INH (.2) (1.0)/RIF/SM	1	2.3
SM/PZA	1	2.3
*TOTAL DRUG RESISTANT CASES	44	100.00

*Includes 2 cases whose resistance emerged in 1990

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MASSACHUSETTS 1990 DRUG RESISTANT TUBERCULOSIS CASES BY COUNTRY OF ORIGIN

COUNTRY	NUMBER	PERCENT
UNITED STATES	23	54.8
HAITI	4	9.5
DOMINICAN REPUBLIC	2	4.7
CAPE VERDE	2	4.7
VIETNAM	2	4.7
CHINA	1	2.4
ETHIOPIA	1	2.4
FRANCE	1	2.4
LAOS	1	2.4
LEBANON	1	2.4
LIBERIA	1	2.4
MOROCCO	1	2.4
NIGERIA	1	2.4
POLAND	1	2.4
TOTAL	42	100.0

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Appendix 10

MASSACHUSETTS TUBERCULOSIS CASES AMONG HIGH RISK GROUPS

1990

POPULATION	NUMBER	PERCENT
FOREIGN BORN	205	46.5
CHILDREN (<1-14 YRS)	24	5.5
HOMELESS	38	8.7
TB/AIDS	22	5.0
CHRONIC CARE FACILITY	14	3.2
PRISON/JAILS/DETOX	20	4.6
PERSONS W DRUG RESISTANCE	38	8.7

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MASS. HS30.901:991

MAKE MASSACHUSETTS TB FREE

GOVERNMENT DOCUMENTS
COLLECTION

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BUREAU OF COMMUNICABLE DISEASE CONTROL
DIVISION OF TUBERCULOSIS CONTROL

ANNUAL REPORT, 1991

UMASS/AMHERST
312066016845381

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

David Mulligan, Commissioner

Alfred DeMaria, Jr., M.D., Assistant Commissioner

DIVISION OF TUBERCULOSIS CONTROL

Sue Etkind, R.N., M.S.

Edward Nardell, M.D., Tuberculosis Control Officer

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INTRODUCTION

Massachusetts continues to be among the top 20 states with the highest prevalence of tuberculosis. In 1991, 438 cases (case rate of 7.38 per 100,000 population) were reported and verified. This represents a 15% increase in only 4 years and appears to parallel the trend that has been noted on the national level. Increases in TB cases occurred in several high risk groups in the State. These include: the homeless, injection drug users, the HIV infected, the elderly, the foreign born and all minority groups. Given that each of these cases potentially transmits their disease to others, thereby adding to the current pool of infected persons in the Commonwealth (estimated to be over 100,000), these increases have serious implications.

This report, consisting of data from several sources, is a summary and analysis of calendar year 1991 tuberculosis (TB) morbidity and control activities. Tuberculosis morbidity information is collected from health care providers, including Health Departments, hospitals and private physicians.

The Division of Tuberculosis Control is charged with all aspects of disease surveillance and control. This Report highlights these activities and the accomplishments of the Division staff despite tight fiscal constraints and personnel shortages. Tuberculosis continues to be a significant cause of morbidity in Massachusetts and given current resources, the prospects for its elimination are not encouraging.

Recognition and thanks for continuing the battle against an ancient foe are extended to our field staff, the local Health Departments and Boards of Health, the American Lung Association of Massachusetts, hospitals, nursing homes, physicians and other health care providers.

Alfred DeMaria, Jr., M.D.

Sue ETKind
Sue Etkind, R.N., M.S.

Edward A. Nardell, MD,
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PART I

TUBERCULOSIS IN MASSACHUSETTS, 1991

1. THE TUBERCULOSIS PROBLEM:

NOTE: Except where stated, case rates for 1990 and earlier years were based on population data projected from the 1980 census; 1991 case rates were calculated using 1990 census population data. As the 1990 census data showed a greater than projected increase in most populations in Massachusetts, decreases in case rate trend data may be noted. All case rates are per 100,000 population.

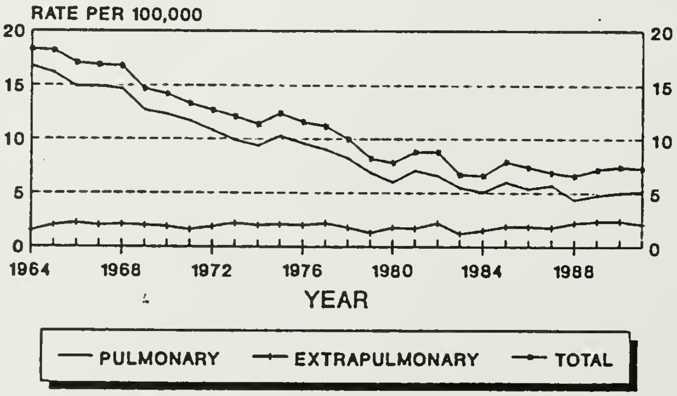
a. 1991 TUBERCULOSIS CASES OVERVIEW:

Demographic analysis of the 1991 tuberculosis cases as compared to the 1990 cases is as follows:

Massachusetts continues to have an unacceptably high incidence of tuberculosis. In 1991, 438 cases (case rate of 7.28 per 100,000) were reported and verified by the Division of Tuberculosis Control.

This figure is similar to the 1990 figure. When cases are analyzed over the last 4 years however, **A 15% INCREASE IS NOTED.** A total of 20 "high risk" communities had seven-year mean case rates above the State average - the highest of which was Chelsea (34.83 per 100,000). The Chelsea case rate **DOUBLED** in 1991 from 1990, and in fact was the highest case rate of any "high risk" community in over a decade. The City of Boston followed with a case rate of 24.55 - a decrease of 5.4% from 1990. Three additional cities were added to the "high risk" communities list this year based on their case rates (Appendix 1) - Fall River (16.18), Malden (14.85), and Quincy (10.59). Substantial increases in tuberculosis cases were also noted in several other communities.

MASSACHUSETTS TB CASE RATES
BY SITE AND YEAR
1964-1991



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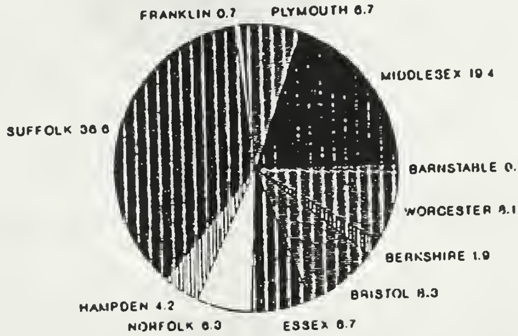
For surveillance and comparison purposes, cities and towns with 5 or more cases are ranked by their case rates (Appendix 2). To protect confidentiality, cities with less than 5 cases are not reported.

Residence:

Suffolk County continues to account for over one third (37%) of the tuberculosis cases in Massachusetts, followed by Middlesex County (19%). This year only one of the fourteen counties in Massachusetts was free of tuberculosis cases.

VERIFIED TUBERCULOSIS CASES BY COUNTY
1991 (N= 432)*



Percent of Cases

*6 other cases are state at large

Hampshire-.2%, Nantucket-.2%

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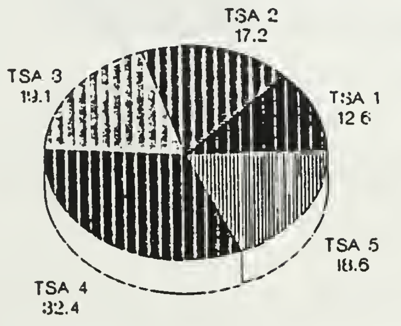
If the cases are analyzed by geographic district (TSA - Tuberculosis Surveillance Area), it can be noted that TSA 4 (Boston) accounts for almost one third of the total cases (a 2% decrease in 1991), while the other tuberculosis cases are fairly evenly distributed between the remaining four TSAs (1 - 13%, 2 - 17%, 3 - 19%, 5 - 19%).

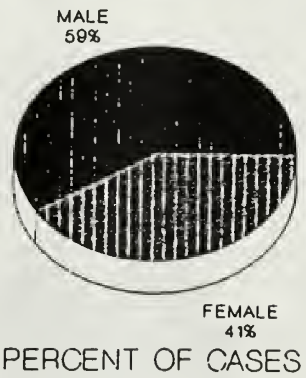
MASSACHUSETTS TUBERCULOSIS CASES BY
TUBERCULOSIS SURVEILLANCE AREA (TSA)*
1991



PERCENT OF CASES

__Age and Sex__: (Appendix 3)

Of the 1991 tuberculosis cases which met the CDC count criteria, 59% were male and 41% were female (a 4% increase in the number of female cases from 1990).



MASSACHUSETTS TUBERCULOSIS
CASES BY SEX
1991

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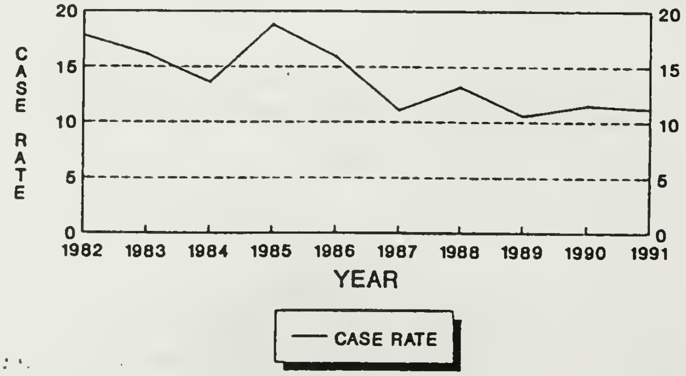
When cases in the elderly are analyzed, it is noted that 21% of the cases in 1991 were age 65 or older (no significant change from 1990). However, when analyzing the case rate trend, it is noted that the steady downward decline seen from 1982 - 1987 has stopped.



RATE OF TUBERCULOSIS IN PERSONS
AGE 65 AND OVER
MASSACHUSETTS 1982-1991

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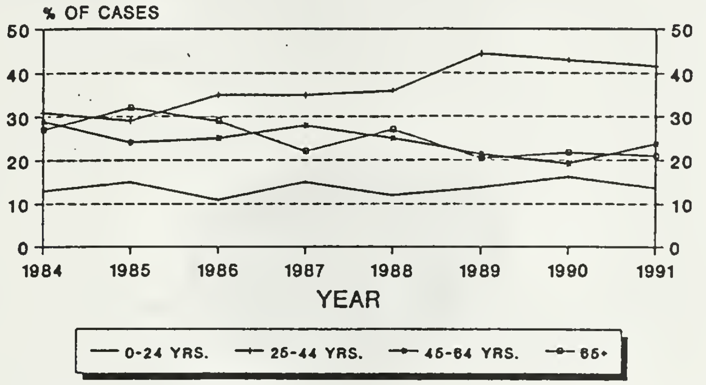
Forty-two percent of the 1991 cases were in the 25-44 year age group. A breakdown of age categories for the last 7 years demonstrates the **continued UPWARD TREND** in this age group.

MASSACHUSETTS TUBERCULOSIS CASES
BY AGE GROUP AND YEAR
1984-1991



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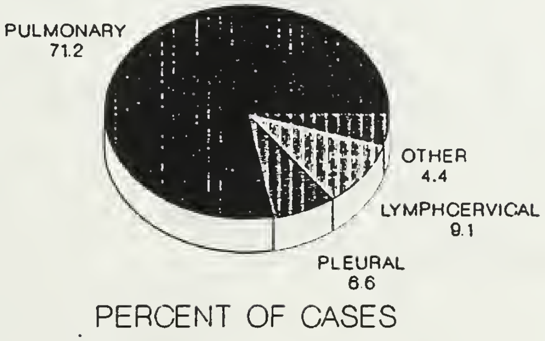
Clinical Characteristics:

Pulmonary versus extrapulmonary (Appendix 4-5)

The primary site of disease for seventy-one percent of the cases in 1991 was pulmonary (a 5% increase from 1990). This was followed by lymph/cervical (9.1%), pleural (6.6%) and numerous other sites, each less than 3%.

MASSACHUSETTS TUBERCULOSIS CASES
BY PRIMARY DISEASE SITE
1991 n=438



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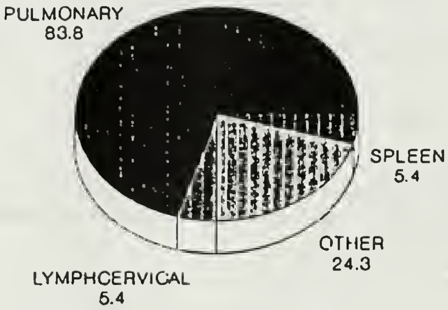
When cases with multiple disease sites are analyzed, it is noted that 83.8% had pulmonary involvement, with pulmonary site as the primary site in 64.9% of these cases (an 18% increase since 1990); 29.7% of the cases had a pleural site; lymphatic/cervical, genitourinary and spleen sites were each present in 8.8% of the cases.

TUBERCULOSIS CASES WITH
MULTIPLE SITES
MASSACHUSETTS 1991
37 Cases/75 Sites

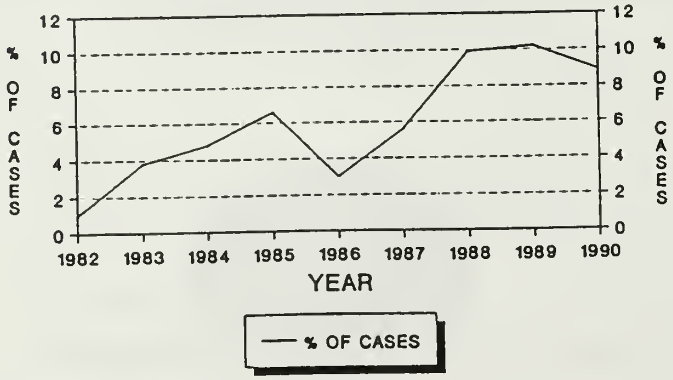


PERCENT OF MULTIPLE SITE CASES

MDPH DIVISION OF TB CONTROL

The percent of cases with multiple sites has continued its **upward trend** since 1982, with a twofold increase noted since 1986.

PERCENT OF TUBERCULOSIS CASES
WITH MULTIPLE SITES
MASSACHUSETTS 1982-1990



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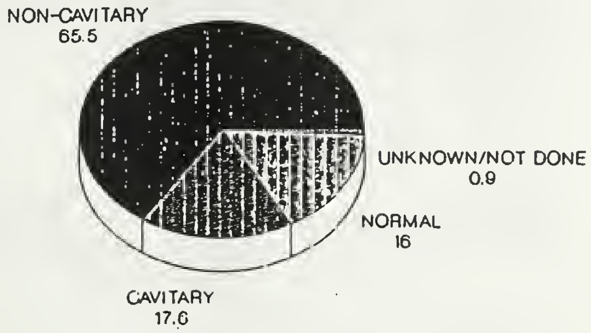
Cavitary versus noncavitary

Sixty-six percent of the 1991 cases had noncavitary disease (**A 9% INCREASE OVER 4 YEARS**), 17.6% were cavitary, 16% had normal radiographs, and 0.9% were unknown or had no chest x-ray done.

MASSACHUSETTS TUBERCULOSIS CASES
BY X-RAY RESULT
1991 (N=438)



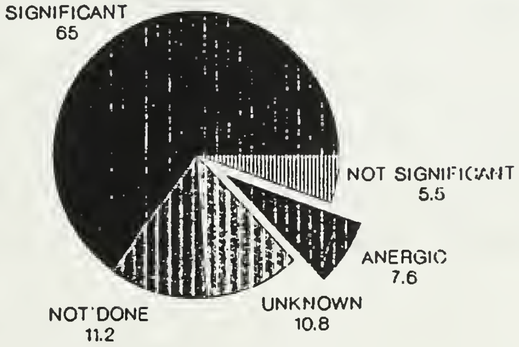
PERCENT OF CASES

MDPH DIVISION OF TB CONTROL

Significant versus nonsignificant skin tests

Sixty-five percent of the cases in 1991 had significant skin tests, 10.8% were unknown, 11.2% were not done, 5.5% were nonsignificant and 7.6% had documented anergy.

MASSACHUSETTS TUBERCULOSIS
CASES BY SKIN TEST RESULTS
1991 (N=438)



PERCENT OF CASES

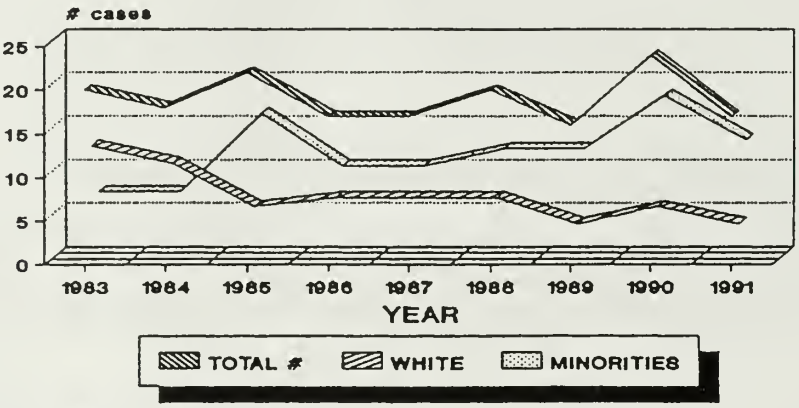
MDPH DIVISION OF TB CONTROL

b. BACTERIOLOGIC CONFIRMATION:

In 1991, 328 cases (75%) were bacteriologically confirmed. This is a bacteriologically substantiated incidence rate of 5.45/100,000.

c. CASES AMONG CHILDREN:

The percent of cases in children ages 0-14 years in 1991 decreased from 5.5% in 1990 to 3.9% in 1991; the increase noted in the 15-19 year age group in 1990 remained the same in 1991. However, when analyzed over time using case rates, there **has been a gradual increase in both age groups over the last five years.**



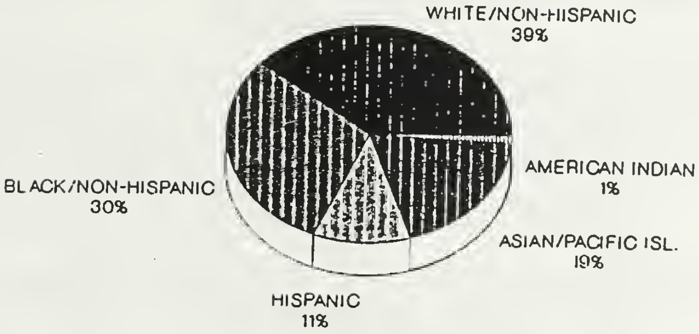
TUBERCULOSIS CASES IN CHILDREN < AGE 15
BY RACE/ETHNICITY
1983-1991

MDPH DIVISION OF TB CONTROL

d. CASES AMONG RACIAL AND ETHNIC GROUPS: (Appendix 6)

This year, cases in minorities continued to rise, accounting for **MORE THAN 60%** of the tuberculosis cases in Massachusetts (black/non hispanic 30%, hispanic 11%, Asian/Pacific Islanders 19% and American Indians 1%). This is a **19 PERCENT OVERALL INCREASE IN CASES AMONG MINORITIES IN THE LAST 5 YEARS**, with black/non hispanics representing the greatest increase (11%).

MASSACHUSETTS TUBERCULOSIS CASES BY RACE/ETHNICITY 1991 (n=438)



PERCENT OF CASES

MDPH DIVISION OF TB CONTROL

When the race and ethnicity of cases are analyzed by case rates, the differences between non minority cases and minority cases is very striking. The **relative risk** for 1991 minority cases is: **BLACK/NONHISPANIC - 14.8, HISPANIC - 5.1, AND ASIAN/PACIFIC ISLANDER - 18.2**

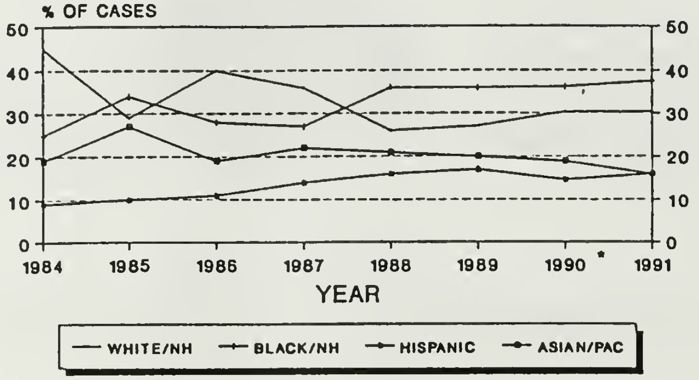
TUBERCULOSIS CASES BY RACE/ETHNICITY MASSACHUSETTS 1987-1991

CASE RATES/100,000

	WHITE/NH	BLACK/NH	HISPANIC	ASIAN
1988	3.39	34.98	14.61	42.54
1989	3.47	41.54	16.35	53.00
1990	3.41	45.91	18.08	53.00
1991	3.26	48.09	16.69	59.28

Looking specifically at the 25-44 year age group, it can be noted that cases in **minorities continue to account for 69% of all cases in this age group** (black/non-hispanic 37.4%, Hispanic 15.9% and Asian/Pacific Islanders 15.9%).

MASSACHUSETTS TUBERCULOSIS CASES
BY RACE/ETHNICITY, AGES 25-44 YEARS
1984-1991*



MDPH DIVISION OF TB CONTROL

* excludes 4 American Indian cases

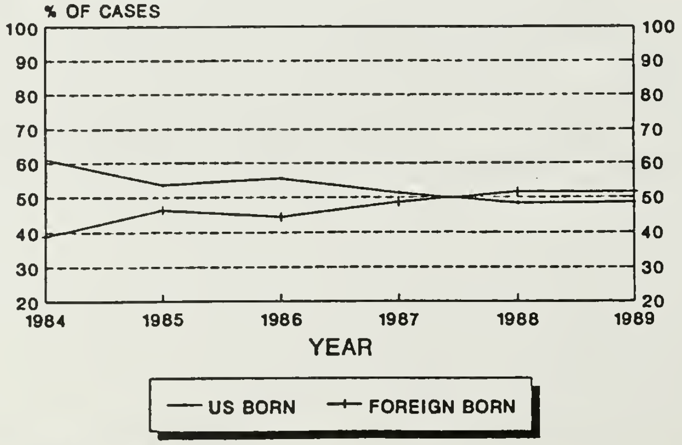
When the 1991 cases are analyzed by race/ethnicity and age group it can be noted that although the proportion of cases in children decreased slightly, **THE MAJORITY OF THE CASES (77%) CONTINUE TO BE REPORTED AMONG MINORITIES.**

e. **CASES IN FOREIGN BORN PERSONS:** (Appendix 7)

NOTE: In order to reflect the citizenship status of persons born in Puerto Rico, these persons are categorized as U.S. born.

For the first time, the foreign born cases now account for **over half** (51.1%) of our overall tuberculosis cases. The foreign born **REMAIN THE HIGHEST RISK GROUP FOR TUBERCULOSIS IN MASSACHUSETTS.**

TUBERCULOSIS CASES BY PLACE OF BIRTH
MASSACHUSETTS 1984-1989

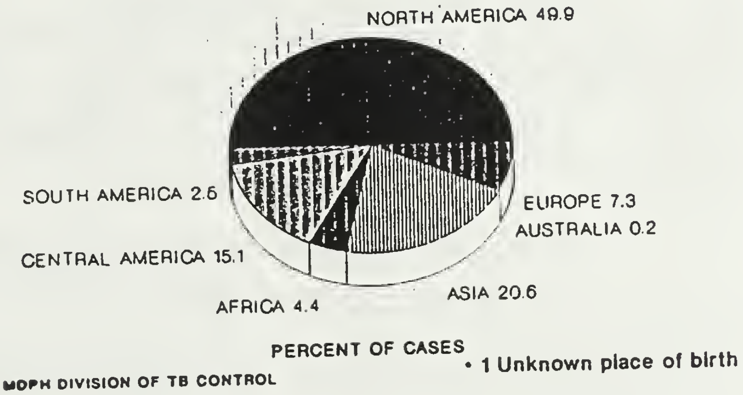


MDPH DIVISION OF TB CONTROL

Haitians continue to represent the largest group (19% of the foreign born cases), followed by Vietnamese (10%), Chinese (10%), Cambodians (8%), Dominican Republicans (5%), Cape Verdeans (5%) and Indians (4%). Although the number of Southeast Asian cases remained about the same in 1991, there has been a 10% increase in cases in Southeast Asians overall since 1989. Cases from 36 other different countries were reported, each representing less than 2% of the overall tuberculosis cases for 1991.

When foreign born cases are analyzed by continent instead of just by country, half the cases are from North America; the remainder are primarily from Asia (21%), and Central America (15%). Of concern is the number of cases from Pattern II countries in Africa and Central America (17%).

MASSACHUSETTS TUBERCULOSIS CASES
BY PLACE OF BIRTH*
1991



* 1 Unknown place of birth

MDPH DIVISION OF TB CONTROL

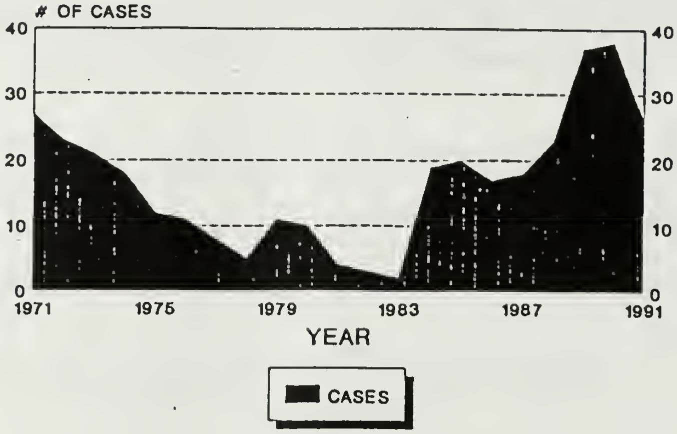
Case rates for the populations with the largest number of cases are quite alarming: Vietnamese (148.87), Chinese (40.89) and Cambodians (128.11). Population data are unavailable for the number of Haitians and Cape Verdeans in Massachusetts.

f. CASES IN THE HOMELESS POPULATION:

Growing numbers of homeless particularly in Boston, continue to pose tuberculosis control problems. Overcrowding in shelters and the poor nutritional status of clients are contributing factors to the continuation of transmission in this group. It is estimated that there are more than 6,000 homeless in Boston and approximately 23,000 homeless statewide.

This year, 26 homeless cases (case rate approx. 113.04) were reported (a 33% decrease from 1990). Although overall this is a positive outcome, of concern is the increasing number of homeless cases outside the City of Boston.

TB CASES AMONG THE HOMELESS
MASSACHUSETTS,1971-1991



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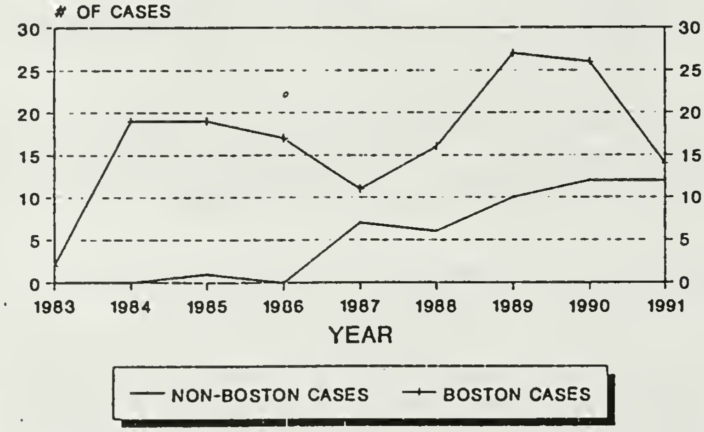
Fifty-four percent of these cases were in Boston and 46% were outside of Boston (**a 19% increase since 1989**). Non Boston cases have been gradually increasing since 1986. Of particular concern is the fact that for the second year in a row, cases of tuberculosis are now being reported in **FAMILY SHELTERS** - not just shelters for homeless men.

TB CASES AMONG THE HOMELESS
MASSACHUSETTS, 1983 - 1991



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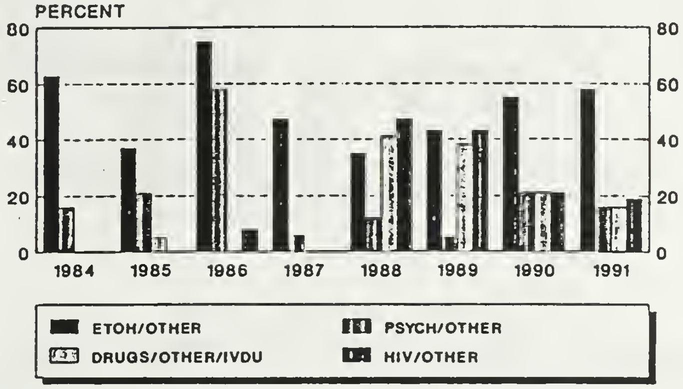
Of concern is the fact that: 1) rates among persons with psychiatric disorders are increasing (16%); 2) 16% of these cases are reported as being injection drug users (IDUs); and 3) 19% have a known documented positive HIV status. This is presumably only the "tip of the iceberg" as HIV testing is voluntary in Massachusetts.

Also of interest, is that the number of cases among homeless females is increasing (26%) which is related to cases identified in family shelters. This changing profile of homeless tuberculosis cases is posing very serious prevention and control problems as this group of clients is at greater risk of infection and disease.

HOMELESS TUBERCULOSIS CASES
BY RISK FACTORS*
1984-1991



MDPH DIVISION OF TB CONTROL

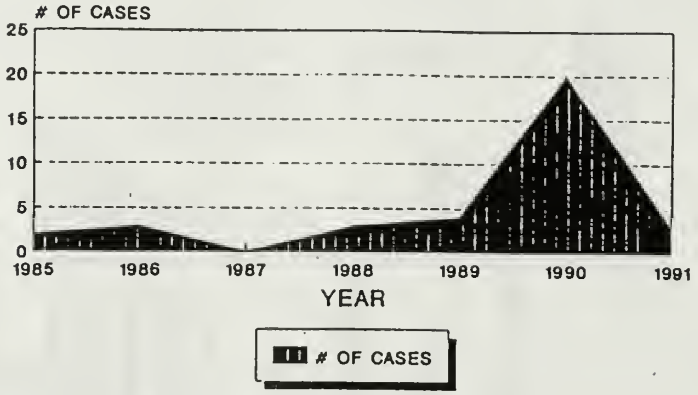
*1984-1989 only Boston shelter cases
not mutually exclusive

g. **CASES IN INSTITUTIONS:**

Persons in Correctional Facilities:

Where in 1990 there was a five fold increase in cases reported from correctional facilities in Massachusetts, in 1991 only 0.7% of the cases were from the correctional system. An outbreak of tuberculosis with widespread transmission occurred at a prison located in the southeastern part of the State in 1990. This outbreak led to a massive screening effort (12,000 PRISONERS AND STAFF). Following this outbreak in 1990 and the massive screening and educational program, routine screening for inmates was instituted at all the State prison facilities, which has resulted in more awareness of tuberculosis, and earlier screening and intervention.

MASSACHUSETTS TUBERCULOSIS CASES
IN CORRECTIONAL FACILITIES
1985-1991



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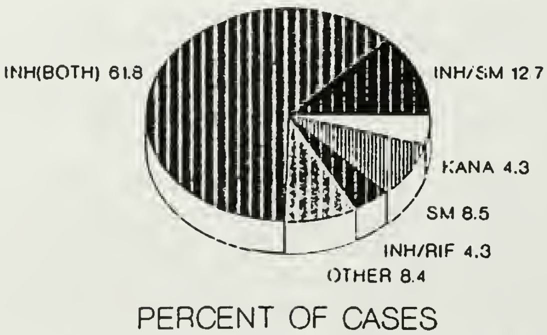
Persons in Long Term Care Facilities:

This year, there were 15 (3.4%) cases reported from long term care facilities (a slight increase from 1990). Most of these were in nursing homes (10) or other chronic care facilities (2) and 2 cases were reported in nursing home employees.

h. **CASES WITH DRUG RESISTANCE:** (Appendix 8-10)

In 1991, Isoniazid (INH) resistance (both concentrations), accounted for 61.8% of the drug resistant cases, INH and Streptomycin (SM) resistance 8.5%, SM resistance alone 8.5% and other combinations 21.2%.

MASSACHUSETTS TUBERCULOSIS CASES
BY DRUG RESISTANCE
1991 (n=47)*



* 1 case from a prior year developed resistance in 1991

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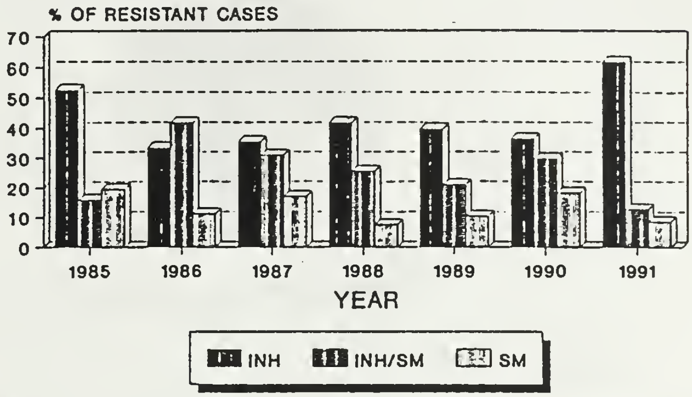
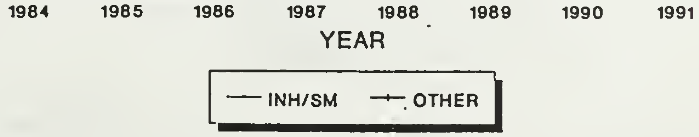
If drug resistant cases are analyzed over time, it can be noted that although INH/SM and SM resistance cases both decreased since 1990 (by 17% and 12% respectively), INH resistance increased 27% in the last year.


MASSACHUSETTS DRUG RESISTANT TUBERCULOSIS CASES BY DRUG 1985-1991

MDPH DIVISION OF TB CONTROL

For the homeless, the INH/Streptomycin resistance pattern (which was implicated in the 1984-85 outbreak and has continued since), decreased significantly - only 8% of the homeless drug resistant cases are I/S resistant. Persons who are homeless now account for only 8% of the total drug resistant cases in Massachusetts.

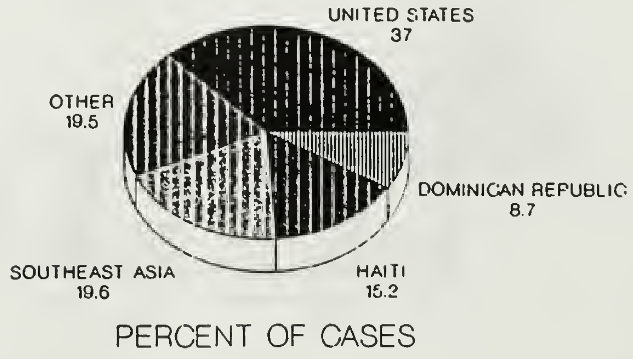

PATTERN OF DRUG RESISTANCE AMONG HOMELESS TUBERCULOSIS CASES MASSACHUSETTS 1984-1991

MDPH DIVISION OF TB CONTROL

This year, 63% of the total drug resistant cases are in the foreign born population (**an 18% increase from 1990 and a 23% increase from 1989**). The greatest percentage of these were from

Haiti (28%) - a 10% increase, followed by Vietnam (25%) - a 13% increase, Dominican Republic (14%) and 9 other countries.

MASSACHUSETTS DRUG RESISTANT
TUBERCULOSIS CASES BY COUNTRY OF ORIGIN
1991 (n=46)



MDPH DIVISION OF TB CONTROL

Of the resistant cases with a known etiology, 12.8% were treatment failures - **an 8% increase from 1990, suggesting an increase in noncompliance**, 8.5% were in the homeless and 7.5% had primary resistance.

ETIOLOGY OF TB DRUG RESISTANCE
MASSACHUSETTS 1991

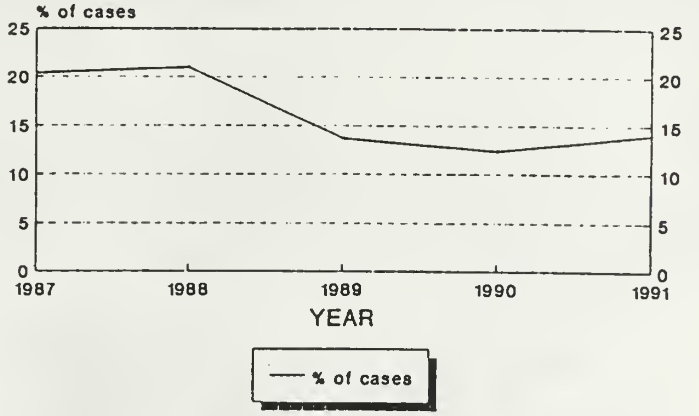
ETIOLOGY •	NUMBER OF CASES	PERCENT
TREATMENT FAILURE	6	12.8
HOMELESS/ASSOC.	4	8.5
PRIMARY RESISTANCE	0	0
FOREIGN BORN	29	61.7
UNKNOWN	8	17.0
TOTAL	47	100.0

• Cases assigned in descending order of priority

MDPH DIVISION OF TB CONTROL

Of concern is that the fact that there was a 4% increase in drug resistance in 1991 as compared to 1990. Although in 1989 there was a 12% decrease in the number of resistant cases reported and an additional 2.5% decrease in 1990, this possible trend reversal will require careful monitoring. **ALSO OF CONCERN, IS THAT 21% OF THE DRUG RESISTANT CASES ARE ALSO KNOWN TO BE HIV POSITIVE.**

PERCENT OF BACTERIOLOGICALLY CONFIRMED
TB CASES WITH DRUG RESISTANCE
MASSACHUSETTS, 1987-1991



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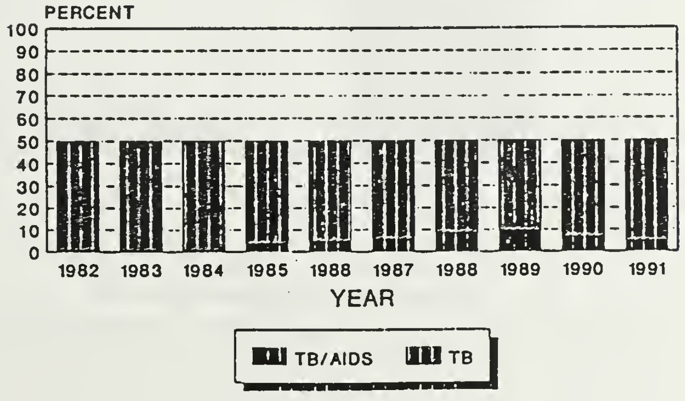
i. **TB/AIDS Cases:** (Appendix 11)

Massachusetts has just completed the matching of the Tuberculosis and AIDS Registries for the period of 1982 through December 1991, and it is clear that the figures are becoming increasingly more alarming. A total of 44 new TB/AIDS cases were added to this register in 1991 (228 matches to date) - the largest number of matches yet.

TB/AIDS cases represented 5% of the 1991 tuberculosis cases. This figure rises with each match, and given that both infections are apt to be prevalent in similar risk groups, intensified efforts are needed to control this epidemic. When analyzed over time, it is noted that with each match the percent of TB cases with AIDS rises per year until the latest matches. Although the percents appear to decrease over the last two years, this is a misperception due to the lagtime before cases of TB are diagnosed with AIDS. This phenomenon mimics the AIDS data which suggests that preventive treatments for HIV infection appear to be delaying the onset of AIDS.

PERCENT OF TB CASES
THAT ARE ALSO TB/AIDS
1982-1991



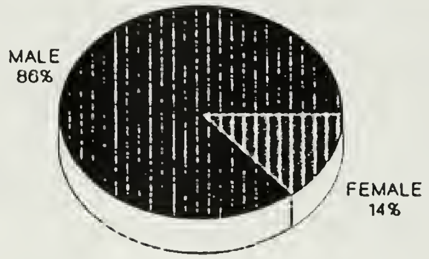
NOTE: When comparing the TB/AIDS cases to the AIDS cases, the TB/AIDS cases are excluded from the total AIDS cases.

Demographic analysis of the TB/AIDS cases to date is as follows:

Age and Sex:

Mean age at diagnosis of AIDS for the TB/AIDS cases was 35 years. Eighty-six percent of the TB/AIDS cases were male and 14% were female - a 2% increase from 1990. This may reflect the increasing number of AIDS cases in women.

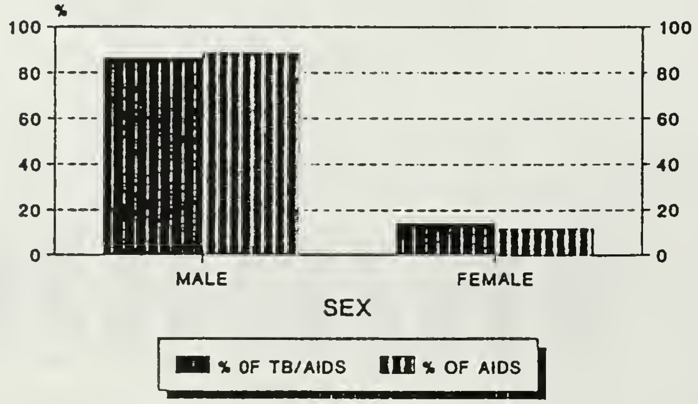
MASSACHUSETTS TB/AIDS CASES
BY SEX 1982-1991 (n=228)



MDPH TB/AIDS DIVISIONS

When compared to the AIDS cases alone, slightly more females were noted in the TB/AIDS group than in the AIDS alone.

MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY SEX
1982-1991 (n=228)

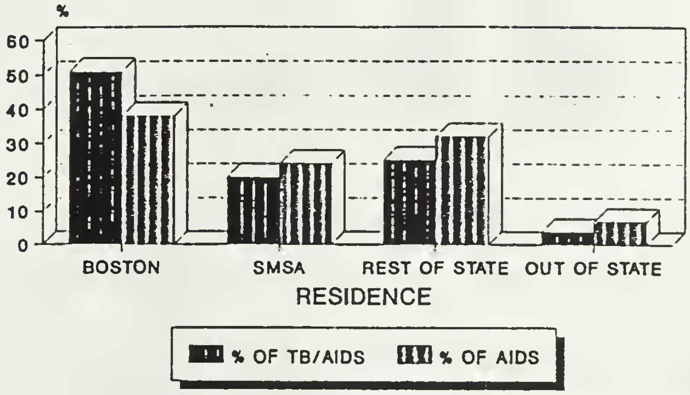


MDPH TB/AIDS DIVISIONS

* excludes those diagnosed with TB

Residence:

Over half of the TB/AIDS cases (51%) and 38% of the AIDS cases resided in the City of Boston at the time of diagnosis. The SMSA accounts for an additional 20% and 24% respectively. When analyzed over time, the number of cases from Boston is slowly shifting to outside of Boston.



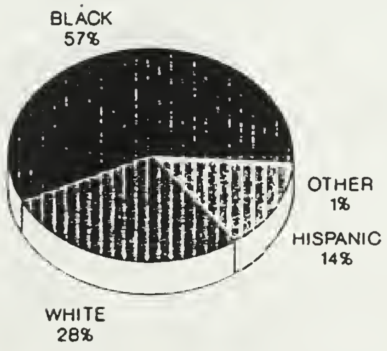
MASSACHUSETTS TB/AIDS AND
AIDS* CASES BY RESIDENCE
1982-1991 (n=228)

MDPH TB/AIDS DIVISIONS

* excludes those diagnosed with TB

Race/Ethnicity:

Minorities accounted for 72% of the TB/AIDS cases.

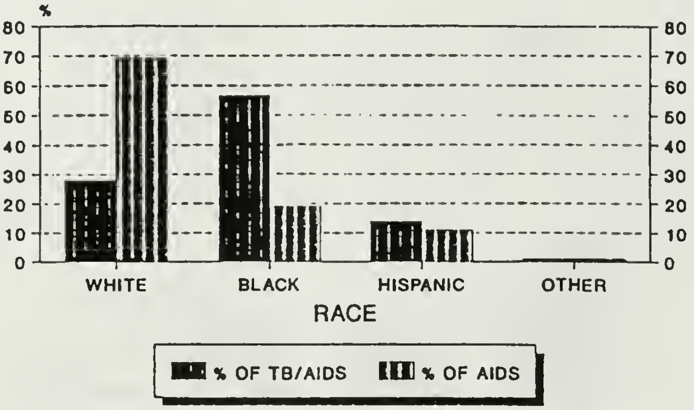


MASSACHUSETTS TB/AIDS
CASES BY RACE
1982-1991 (n=228)

MDPH TB/AIDS DIVISIONS

When compared to the AIDS cases in Massachusetts, the proportion of TB/AIDS cases that were black is considerably higher (57% vs. 19%).

MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY RACE
1982-1991 (n=228)



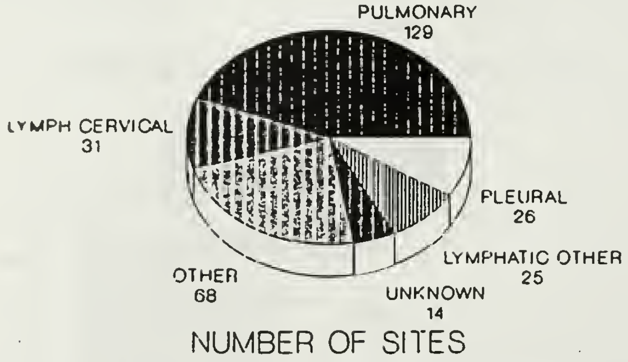
MDPH TB/AIDS DIVISIONS

* excludes those diagnosed with TB

Disease Site: (Appendix 12)

Fifty-seven percent of the TB/AIDS cases had a pulmonary site of disease, 25% had lymphatic, 11% had pleural, and 6% had spleen sites. The remainder of the extrapulmonary cases were in other sites, each representing 4% or less of the total TB/AIDS cases.

MASSACHUSETTS TB/AIDS CASES BY
TB DISEASE SITE
1982-1991 n=228/sites=293



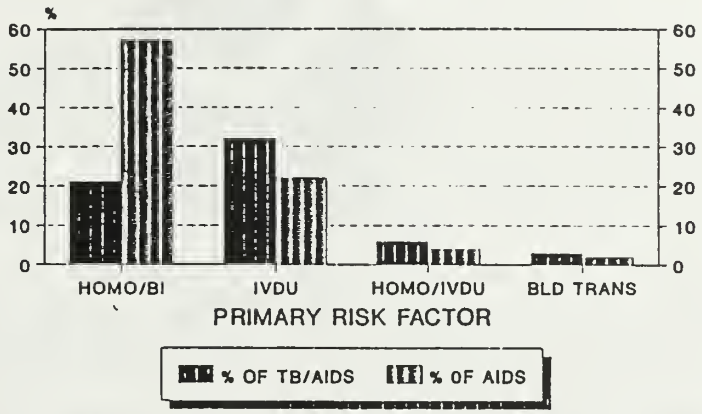
MDPH TB/AIDS DIVISIONS

* 65 have multiple sites of TB

Primary Risk Factors:

The homosexual/bisexual category still accounts for the majority of the AIDS cases in Massachusetts (57%). Twenty-one percent of the TB/AIDS cases also fall under this category. Of particular interest to the Tuberculosis Program, is the number of TB/AIDS cases among the foreign born (32%) as compared to the number of AIDS cases in that category (3%). (Note, the "foreign born" category only includes those who have not been classified into one of the other risk categories, i.e. homosexual/bisexual, IDU, etc.). Injection drug use accounts for 32% of the TB/AIDS cases and 22% of the AIDS cases.

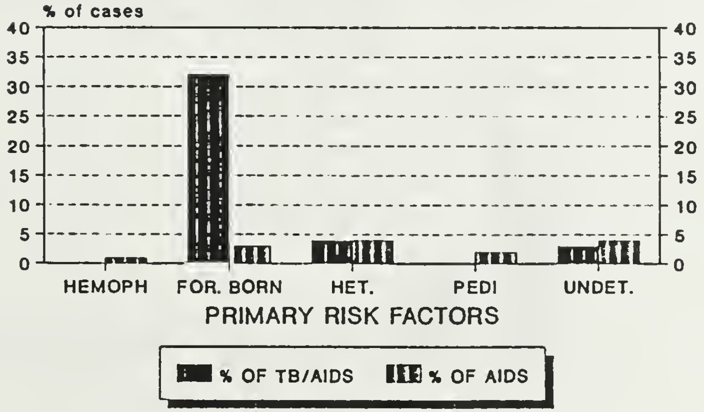
MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY PRIMARY RISK FACTORS
1982-1991 (n=228)



MDPH TB/AIDS DIVISIONS

* excludes those diagnosed with TB

MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY PRIMARY RISK FACTORS
1982-1991 (n=228)



MDPH TB/AIDS DIVISIONS

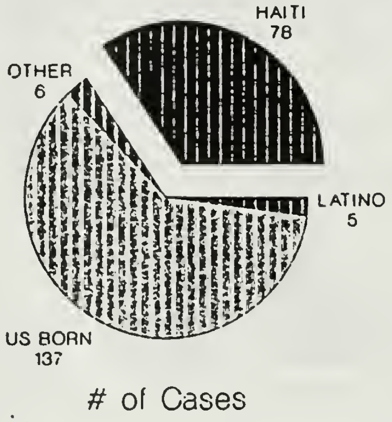
* excludes those diagnosed with TB

Cases of TB/AIDS among IDUs and the foreign born are slowly increasing in the Commonwealth and are expected to account for even greater increases in the future.

Foreign Born:

When TB/AIDS cases who are foreign born are analyzed by place of birth, **the majority (88%) are noted to be Haitian.** Persons from latino countries comprise half of the remaining cases in this category.

MASSACHUSETTS TB/AIDS CASES
BY PLACE OF BIRTH *
1982-1991 (n=228)

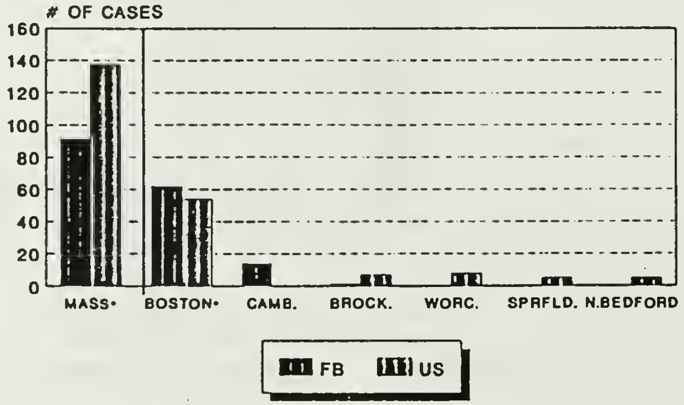


MDPH TB/AIDS DIVISIONS

* 2 Unknown place of birth

When the TB/AIDS cases are further analyzed by place of birth and city of report, it can be noted that six cities account for 67% of the TB/AIDS cases and 84% of the total foreign born cases in this category. Of the TB/AIDS cases reported from the City of Cambridge, all have been foreign born.

MASSACHUSETTS TB/AIDS CASES FOR CITIES
HAVING >5 CASES BY PLACE OF BIRTH*
1982-1991 (n=228)



MDPH TB/AIDS DIVISIONS

*2 unknown place of birth

j. HIV INFECTION PREVALENCE IN SELECT SUB-GROUPS:

There is limited data available about HIV infection prevalence in Massachusetts as HIV infection is not reportable and HIV testing is not a routine procedure in many settings. Exceptions to this are the following:

Voluntary Testing:

* The Department of Public Health's Sexually Transmitted Disease (STD) Clinics Voluntary Counseling and Testing Program: Data from these clinics indicates that from January 1st to September 31, 1991, an overall **seropositivity rate of 3%** was found. The greatest rates of seropositivity were noted among males (4%), minorities (blacks 5%, Hispanics 5%), gay/bisexual males (10%), IDUs (11%), heterosexual partners of at risk groups (4%) and other high risk groups (2%).

* Alternate Test Site seroprevalence data: Data for the period from January 1st to September 31st, 1991, for these sites indicates an overall **seroprevalence rate of 5%**. The greatest rates of seropositivity were noted in males (6%), minorities (Blacks 9%, Hispanics 8%), homosexual males (9%), and IDUs (11.%).

* Data from the voluntary HIV testing at the Department of Corrections for the period of October 1, 1990 to September 30, 1991 indicates an overall **seroprevalence rate of 7%** (males 7% and females 10%). Seropositivity rates in high risk groups were: IDU (14%), minorities (Blacks 8% and Hispanics 11%).

Blinded Testing:

* Massachusetts is participating in the National Seroprevalence Survey and blinded HIV testing is being done at three State Tuberculosis Clinic sites (Boston, Cambridge and Brockton) as part of this project. Results from Boston from 6/88 to 6/91 among Class III's and V's indicate a **26% seropositivity rate** (103/394) - significantly higher than the cumulative national TB clinic average seroprevalence figure of 3.4% through 1989. Results from Cambridge and Brockton from 9/89 to 9/91, among Class III and V clients indicate a **seropositivity rate of 8%** (3/37).

* In addition to the protocol funded by CDC to test only Class III's and V's, the Division has been able to independently analyze data from clients placed on preventive therapy at the Cambridge TB clinic. Of the 434 specimens tested to date, a **0.7% seroprevalence rate** has been noted. This is felt to be a reflection

rate has been noted. This is felt to be a reflection of the fact that the highest risk groups for TB/HIV at this site, do not seek clinic care unless they are already symptomatic. Further HIV testing and risk factor analysis is ongoing.

* Data from blinded testing done at the correctional facilities to date is not yet complete and will not be reported officially for several months.

PART II:

1991 TB CONTROL ACTIVITIES:

SURVEILLANCE, CONTAINMENT AND TB ELIMINATION

1. GENERAL TB DIVISION ADMINISTRATIVE ACTIVITIES:

* Reorganized the TSAs to provide better coverage with current resources

* Continued the collaboration with the State Mycobacteriology Laboratory

* Participated in Bureau planning sessions to strategize provision of future TB clinical services

* Participated on the Bureau Committee on Laboratory Reporting of select communicable diseases including tuberculosis

* Participated on the American Lung Association of Massachusetts (ALAM) Lung Disease Guidance Committee

* Assisted with a CDC site visit to the Division

* Met with a representative of RSVP - a senior volunteer program in order to evaluate potential personnel resource possibilities

* Served as a reviewer for CDC for a proposed TB provider questionnaire

* Participated in the Department of Public Health's Committee on Accommodation of Persons with Chronic Illnesses in the Workplace

* Drafted a revised version of the TB component of the Isolation and Quarantine regulations in order to address the uncertainty of duration of therapy and level of infectivity of pulmonary TB cases

* Served as a reviewer for CDC for a proposed Data Management System for Facilities Serving High Risk TB Clients

* Served as a reviewer for a proposed TB Contact Investigation Worksheet from the state of California

* Conducted an orientation and tour of the TB Division for Dr. Allan Hinman of CDC

* Dr. Nardell was selected to be a member of the Committee on Tuberculosis Control for the International Union Against Tuberculosis and Other Lung Diseases

2. TB ELIMINATION PROMOTIONAL ACTIVITIES:

a) NATIONAL LEVEL

* With the Bureau Director and representatives of the Boston TB Program, participated in the Mobilizing for TB Elimination Workshop at CDC

* S. Etkind, Division Director, continued as a member of the National Advisory Council for the Elimination of Tuberculosis

* S. Etkind testified before the National Coalition for the Elimination of Tuberculosis on "The Resource Gap"

* E. Nardell participated in a CDC/NIOSH sponsored Workshop on UV Light and Ventilation issues

* Conducted a national survey of TB Public Health Nurses in order to assess the resource gap at the nursing level and its effect on TB control activities. Presented data from this survey to two sessions of the Advisory Council for the Elimination of Tuberculosis as well as the National Coalition for the Elimination of Tuberculosis.

b) LOCAL LEVEL

* Assisted with the establishment of the Massachusetts Commission for the Elimination of Tuberculosis which had its first meeting in November, 1991.

* Lobbied the New England Public Health Association to include TB Elimination in their next annual meeting agenda

* Testified before the Department of Public Health's Public Health Council on "Tuberculosis in the 90"s"

* Met with Dr. DeMaria, Bureau Director, re: current public health nursing shortages in Massachusetts and the effect on TB elimination efforts

* Met with Mr. John Brinkley, new Executive Director of the ALAM re: collaboration on TB control efforts

SUMMARY: This year has been one which has been devoted to TB Elimination efforts. As will be demonstrated in the following sections, numerous activities have occurred which reflect an increased emphasis on coalition building, resource acquisition, media and marketing strategies. The foremost of these efforts is the formation of the Blue Ribbon Massachusetts Commission for the Elimination of Tuberculosis. This Commission convened for the first time in November of this year. It was created with the support of the state Executive Office of Health and Human Services and the Commissioner of Public Health who serves as the official Commission chairperson. The Commission includes a diverse group of individuals, each of whom is well known in their respective field (Appendix 13). Member representation is as follows: the Executive Director of American Lung Association of Massachusetts, the Medical Director of Health Care for the Homeless, a Haitian physician from Cambridge, an anthropologist from Harvard who has specialized in TB and health care issues in Haiti, legislators (House and Senate), a substance abuse treatment provider, the Medical Director of Medicaid, the Medical Director of an inner city Community Health Center in Boston, a member of the Board of Registration in Medicine, an economist from Harvard who has specialized in TB from the world health perspective, a TB Public Health nurse from a high risk city, a pulmonary physician who has worked in TB and is professor emeritus at Harvard, the Medical Director of a Community Health Center in a southeastern Massachusetts high risk community, a physician from the Department of Infectious Diseases at the University of Massachusetts Medical Center who runs the AIDS Clinic at that institution, the Medical Director of a County House of Correction, the Executive Director of a Hispanic Community-Based Organization, an internist, a pulmonary physician who was Medical Director for the previous Tuberculosis Treatment Unit at Middlesex County Hospital (a long term care facility), and the Senior Vice President for Clinical Affairs for the Massachusetts Hospital Association. This group has been charged with analyzing the past, current and future tuberculosis control picture and developing a Plan for TB Elimination in Massachusetts. Given the level of expertise of the Commission members and the creative strategies that have already been put on the table, the Division looks forward to the culmination of this group's activities. A Report is expected to be forthcoming soon.

3. SURVEILLANCE ACTIVITIES:

a) DATA MANAGEMENT/REPORTS:

* Continued the monthly meetings with the Boston TB Program to discuss surveillance and programmatic issues

* Produced the required weekly, monthly and other periodic reports and graphics for the Division, CDC, etc., including charts, graphs and slides for presentations

* Completed an expansion of the TB case database

* Computerized ORW assignment of cases and DOT management

* Reorganized the Case Registry

* Developed a Case Information Form in order to collect data on case high risk activities and staff assignments

* Restructured the TSAs by approximate zip code areas from four to five areas

- Entered the 1982 through 1985 TB case data into the TB Database
- Completed the 3 month drug resistance survey for CDC
- Completed a private provider survey to assess the source of care of TB cases in Massachusetts
- Completed installation of modems in the field offices
- Completed 2 TB/AIDS Registry matches. These matches were done electronically for the first time this year

SUMMARY:

The Division of Tuberculosis Control has made considerable progress in recent years in improving our surveillance methods. Thanks to the efforts of our Field Services Director (J. Boutotte) and the Surveillance Data Manager (K. Hendricks) - the only two persons who are responsible for data management), we are now able to specifically identify where our tuberculosis morbidity is coming from, and which high risk groups need intensified efforts in order to control tuberculosis. This was not the case as little as 5 years ago. However, given the increasing need for better integration of the overall tuberculosis information flow (surveillance, clinical, pharmacy, budget, Mycobacteriology Laboratory, etc.), the Department of Public Health has made a committment to assist the Division in streamlining it's data activities. There are currently 2 state funded programmers who have been assigned to this Project. Every aspect of the Division's activities, including all case management activities, outreach worker activities, clinic visits, Shattuck Hospital data, drug usage and inventories, TB cultures and drug susceptibilities, reports, etc. will be included. Linkages will be made with the regional offices so that the TSA nurses can directly access the system. All orientation meetings have been completed with the Division staff, the Refugee Health program, the Purchase of Service Office, and site visits have been made to the regional offices and to the Boston City TB Program. Programming is in progress and several forms have already been revised to accommodate the new system. The prospect of such an integrated system is much anticipated as it will clearly assist in streamlining and therefore allow for better prioritization of our resources.

4. CONTAINMENT ACTIVITIES:

a) Outpatient Services:

- Addressed TB drug shortages (Rifampin, PZA, INH, Streptomycin, and Seromycin)
- Conducted a survey of third party payors at 15 selected TB clinic sites

* Approved a new evening TB clinic for the Boston City Hospital site

* Streamlined the TB drug monitoring system by: developing a new drug ordering form; expanding drug usage and drug budget projections; and reverting to a quarterly pharmacy drug inventory system

* Addressed clinic issues at Worcester City Hospital, Boston City Hospital pharmacy, Harrington Hospital, Cranberry Specialty and Barnstable County Hospital

* Completed all contracts for TB clinical services and wrote a new "Attachmant A", describing TB goals, target population, and eligibility and evaluation criteria

* Worked with the Rate Setting Commission to establish new rates for services provided

* Discontinued routine repeat clinic visits for job screening purposes and discontinued payment for CT scans

* Continued the CDC funded "Compliance Study" at 10 TB clinic sites

* Mailed reimbursement mechanism reminder letters to all clinic staff and billing departments (re: atypical mycobacteria cases)

* Developed a form letter to use for cases of inappropriate billing

* Continued the pilot "Communicable Disease Control Clinic" at the Berkshire Medical Center. This clinic provides TB/STD/HIV related services to this geographically remote region

* With the collaboration of the DPH Legal Services, continued work on revising and upgrading the TB regulations

SUMMARY:

Historically, the Division has operated TB Clinics in hospitals throughout the state for some time (currently there are 30 clinics situated in high risk communities - Appendix 1). Cost containment issues have occupied much of 1991 and, as can be seen, numerous strategies to address cost reimbursement, quality control, resource prioritization, drug shortages and increasing costs have been devised by the Director of Policy and Clinical Services, L. Singleton.

The Division continues to pilot a "Communicable Disease Clinic" in Pittsfield which provides TB/STD/HIV related activities. This model is being considered for expansion to other high risk areas. The overall issue of how to provide the most efficient and effective out-patient TB care is being addressed by the new Commission and several new models are under discussion by this group. It is possible that, as a result, an entirely new type of TB out-patient service provision may evolve in the near future.

b) **Inpatient Services:**

- Worked with the Shattuck Hospital on security, legal issues, discharge planning and fiscal issues related to the operation of the new Tuberculosis Treatment Unit
- Mailed letters to all Boards of Health informing them of the new inpatient TB Unit at Shattuck Hospital
- Finalized the in-patient database and began entering client data into the system
- Processed legal involuntary hospitalization papers on 15 non-compliant patients
- Responded to inquiries from the New York City Health Department, the New York State Health Department, the state of Florida, CDC, and Senator Kennedy's office re: the provision of long term TB care at the Shattuck Hospital

SUMMARY:

The Tuberculosis Treatment Unit at the Shattuck Hospital has been in existence for a little over one year. In that short time, a "model" TB long term care facility has been developed. A total of 42 admissions occurred during 1991. Most admissions were primarily due to non-compliance (95%), were alcohol or drug related (78%), 60% were from shelters, 20% had some drug resistance, 38% had some risk of HIV (most were IDU's), 19% were HIV positive and 53% were admitted involuntarily under the legal committment process. The average length of stay was 91 days and correlated with the existence of drug resistance. This Unit operates as a psycho/social milieu and utilizes various behavior modification strategies to address the multiple needs of these clients in order to ensure completion of therapy. Due to the efforts of L. Singleton and the Shattuck Unit staff, this treatment facility has far exceeded our expectations.

PART II:

1991 TB CONTROL ACTIVITIES:

SCREENING AND PREVENTION IN HIGH RISK GROUPS

PREVENTION: SPECIFIC HIGH RISK GROUPS
(Appendix 15)

THE FOREIGN BORN

- Continued the collaboration with the Refugee Health Program (RHP). Outreach workers from this Program and the Division provided tuberculosis prevention and control services to more than 1,740 clients during 1991

- Provided medical consultation to the Refugee Health program in their study on BCG and TB skin testing results among persons arriving from the Soviet Union and the resulting abstract that was submitted to the ATS/CDC Annual Meeting

- Through the RHP, efforts were made to increase linkages with providers of services to refugees from the USSR. Meetings were held with Massachusetts affiliates of the Hebrew Immigrant Aid Society (HIAS), Boston Association of New Americans, Lutheran Family Services, and the Brookline Health Department

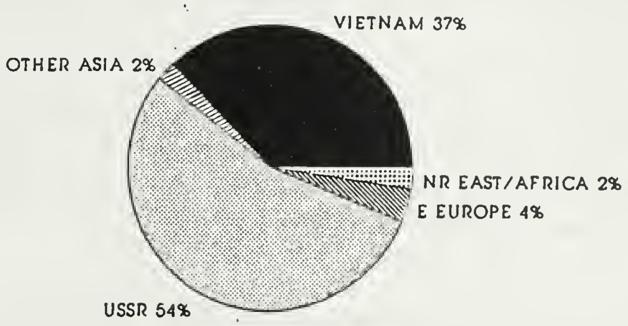
- The RHP Coordinator presented a paper on "Screening of Newly Arrived Refugees from the USSR for TB" at the National Soviet Health Conference meeting in Chicago in December, 1991

- The Division and the RHP co-sponsored a TB Skin Test Training Course with a clinical practicum for outreach workers from both programs

- Met with the Department of Public Health's Office of Minority Health to discuss TB control issues and strategies for minorities

SUMMARY: Massachusetts is **5TH IN THE NATION** with cases among the foreign born and this group represents the **largest high risk group** for tuberculosis in Massachusetts. In 1991, for the first time since our definition of foreign born was changed (to reflect the citizenship of persons born in Puerto Rico), the foreign born represented **MORE THAN 50%** of our morbidity. These cases originate in persons from **MORE THAN 42 COUNTRIES** and continue to occur in persons of varying immigration status. Cases of tuberculosis in children among minority groups are also increasing every year. In addition, fully two thirds of the foreign born cases are in ethnic groups which are not considered "refugees" and are not, therefore, under the sponsorship of the Refugee Health Program. All of these cases are in groups which are among the hardest to reach due to language difficulties, lack of legal status, illiteracy, competing cultural/ethnic beliefs and other unique factors which contribute to noncompliance. Analysis of our TB/AIDS Registries to date indicates that some of these populations are also at increasing risk for dual HIV/TB infections.

1991 REFUGEE ARRIVALS BY COUNTRY OF ORIGIN



N = 3,425

Current screening and prevention efforts for the foreign born are focused in the Refugee Health Program outreach effort. As can be seen by the number of cases and preventives under RHP outreach management and the results of a joint study done by the Division and the RHP, the use of outreach workers who are culturally and linguistically representative of the "at risk" communities, is a strategy that produces results. This type of intensive outreach can ensure access to care through assistance with completion of health assessments and tuberculosis screening and follow-up. **Fully 82% of persons followed by the RHP in the study, were screened and completed preventive therapy as compared to 60% of those with no outreach support.** Due to the nature of the funding, however, the RHP can only target the **refugee** population. This is estimated to reflect only a small percentage of the total foreign born population in Massachusetts. Although tuberculosis does indeed occur in these groups, it is also a disease of immigrants from all over the world and undocumented persons primarily from the Caribbean and Latin America. Outreach to these communities is limited.

PERSONS IN LONG TERM CARE FACILITIES

* Revised the TB Prevention Infection Control Guidelines for Long Term Care Facilities

* Collaborated with the Division of Health Care Quality on a TB Prevention Project including: conducting an in-service for nursing home surveyors; revising the Division TB screening recommendations for patients and staff; conducting a joint mailing of the Division recommendations, ACET recommendations, TB health education materials, etc. to more than 700 long term care facilities statewide

- Met with the Division of Adult and Elderly Health promotion to discuss TB issues for the elderly

- Began discussions with the Division of Health Care Quality re: developing TB recommendations for clients and staff of Mental Health/Group Home Agencies

SUMMARY:

The **SECOND HIGHEST RISK GROUP** in terms of tuberculosis cases in Massachusetts, is persons over the age of 60 years (25% Of all cases in 1991). In addition, this year an outbreak occurred in a long term care facility in a western Massachusetts community which resulted in 4 cases (2 residents, 1 relative and 1 nurses aide).

Given this continuing problem among the elderly, and the demonstrated risk of tuberculosis transmission in long term care facilities, the Division targeted this risk group for intervention activities in 1991. Some of these efforts are listed above. The Division Initiative has several stages. The first is a major effort to educate all staff in all long term care facilities in the state (as well as the Agency staff who are responsible for regulating them) about tuberculosis, TB/HIV, transmission risks in health care settings, screening recommendations and follow-up, and outbreak control activities. This was a collaborative effort with the Division of Health Care Quality. The second phase of the Initiative will be to survey these facilities (or a representative sample of them) in 6 months to a year, to determine if the suggested recommendations for screening and follow-up have, in fact, been put in place, and to identify any obstacles or problems related to screening/preventive therapy of employees and patients. Further phases relating to data collection at the sites, identification of sites needing further intervention, etc. will follow.

As not all of the cases in persons over 60 years of age in Massachusetts are in long term care facilities, L. Singleton has recently established linkages with the Division of Adult and Elderly Health and now attends regular meetings and provides tuberculosis information and consultation as needed to this group. It is hoped that this will evolve into a mechanism for planning future screening and prevention activities for the elderly in general.

SUBSTANCE ABUSERS/ DRUG TREATMENT CENTERS:

- Worked with the Division of Substance Abuse and the Office for Treatment Improvement to plan a seminar dealing with tuberculosis for substance abuse service providers in Boston in March, 1992

- Continued the HIV-Related Prevention Project at three methadone maintenance sites in Boston and 3 sites outside of Boston

- Supported funding proposal for the Boston "Homeless Incentive Project"

- Opened the Shattuck Hospital Tuberculosis Treatment Unit for homeless persons and others who need structured long term TB care

- Continued funding for the TB Clinic activities at the Pine Street Inn and the Long Island shelters

- Submitted for publication an article on "Treating the Hard to Treat TB Patient in Massachusetts"

SUMMARY:
Since 1984, TB has been a particular problem statewide and among Boston's estimated 6,000 homeless persons. From 1984-91, 150 cases of active TB were diagnosed in the Boston group, an average of approximately 19 cases per year. Despite logistic difficulties and the challenges of daily living associated with homelessness, over 90% of homeless persons diagnosed with active TB in Boston receive an adequate course of therapy according to current CDC/ATS guidelines. Two full time TB Control RN's provide case management for all homeless cases, providing TB services on site at several of the city's shelters (including a weekly TB Clinic at one shelter).

Until 1990, the primary goal of TB services in Boston's homeless community was to provide adequate therapy for active cases. However, experience over the past several years indicates that this alone will not solve the problem. Data are available to indicate that 1,115/3,913 (28%) of homeless persons tested for TB in Boston shelters since 1984 have a significant response to PPD (defined as >10 mm induration). This number almost certainly underestimates the prevalence of tuberculous infection in the population because of the problem of anergy. In addition, although HIV results are not available for the majority of persons in BDHH TB database, age and sex breakdown indicate that 375 of the 928 persons (40%) with a significant response to PPD are male and between the ages of 25-44, the demographic group at highest risk for HIV.

Limited data are also available from Boston's Health Care for the Homeless Program (HCHP) to suggest that HIV infection is a significant problem in the city's homeless. Since 1985, HCHP has provided medical care for over 400 homeless persons known to be HIV infected. Of the 52 AIDS cases in this cohort, nine (17%) had extrapulmonary TB as their AIDS defining diagnosis, underscoring the importance of preventive TB therapy for the homeless population. In addition, 19% of the Boston homeless cases in 1991 were known to be HIV positive.

In the fall of 1990, BDHH received funds from the Boston Foundation (a private philanthropic organization) to develop a program for needy persons with tuberculous infection. The objectives of the program were to deliver preventive TB therapy to homeless persons infected with TB who were at high risk of progression to active disease through the use of incentives. An additional objective was to evaluate the usefulness of

* Provided on-site TB/HIV in-services and data support to both non-Boston and Boston methadone maintenance sites

SUMMARY:

Injection Drug Use is the **THIRD HIGHEST RISK FACTOR** for tuberculosis in Massachusetts. Data relating to tuberculosis among IDUs has been difficult to obtain. However, if the Division analyzes the 1991 tuberculosis cases with known risk factors, fully 14% were known to be injection drug users. In addition, data from the unlinked HIV seroprevalence surveys in Boston, as well as information from a survey of risk behavior in persons with known or suspected active disease since mid-1990 who attended the Boston City Hospital TB Clinic, confirm that injection drug use (IDU) is closely associated with HIV infection in those with tuberculous infection or disease. Because of the significant TB/HIV connection demonstrated in IDUs, substance abusers should be considered a priority intervention group for delivery of preventive TB therapy. However, compliance with a 6 to 12 month course of therapy, difficult in many populations, is particularly problematic in substance abusers. The Boston TB Program reports that experience within that city over the past several years indicates that delivery of any TB therapy (whether for active disease or prevention) is more likely to be successful in addicts who are receiving treatment for substance abuse. To that end, the Division is currently funded through the HIV-Related TB Prevention Project to provide TB screening and preventive therapy to 6 Methadone Maintenance sites using outreach and Directly Observed Therapy.

The Division of Tuberculosis Control is also working in a collaborative effort with the Boston TB Program, the State Division of Substance Abuse and the Office for Treatment Improvement (OTI) to provide an educational session to substance abuse service providers funded through the OTI Project in the City of Boston. In addition, in the recent past, we have collaborated on the TB component of a questionnaire for detox centers; a manual for infectious diseases for substance abuse service providers; mailing of CDC materials; and the development and dissemination of TB control recommendations for all types of sites (methadone maintenance, detox, recovery homes, outpatient counseling sites, etc.)

THE HOMELESS

* Reevaluated and renewed the contractual agreement for the provision of respite unit beds for homeless persons with TB at the Shattuck Shelter

* Evaluated the staff skin testing data at Pine Street Inn as part of the UV light on-going evaluation

* Continued the funding for the Boston "homeless" designated support staff

* Maintained the "Homeless" database for cases of TB

incentives in the homeless by comparing compliance with therapy in persons participating in an incentive program with those who did not.

The program began in November, 1990 and is currently ongoing. Homeless persons at high risk of progression to active TB (usually either due to known HIV infection or a history of substance abuse) who are started on preventive TB medication are offered different items when they present to a pre-arranged clinic or shelter site to obtain their TB medication. To participate in the program, individuals must agree to receive directly observed therapy. Items used as incentives include cash or food vouchers (Burger King), each with a value of $6 per week per person.

PERSONS AT RISK FOR OR WITH TB/HIV INFECTION:

* Continued the HIV blinded seroprevalence survey at a total of 3 TB clinic sites

* Planned the expansion of the seroprevalence survey to include Class II persons placed on preventive therapy in Brockton

* Attempted to complete a death certificate match with the assistance of the AIDS Program

* Revised the private provider follow-up, clinic, and the case investigation forms to include questions about HIV risk assessment

* Collaborated with the Boston TB Program and the state AIDS Program to assess the resource needs for HIV counseling and testing at the Boston TB clinic sites

* Collaborated with the AIDS Program to conduct a 3 month HIV risk assessment survey at 4 high risk TB clinic sites

* Worked with the AIDS Program to provide TB input into the CDC/AIDS Cooperative Agreement application

* Continued the TB/STD/HIV Working Group activities including: a matching of the syphilis and TB Registries and the investigation of the feasibility of using seroprevalence bloods to determine syphilis/TB/HIV connections

* Worked with the AIDS Program to conduct an inservice training, and set up a TB orientation package and referral process for the Alternate Test Site (ATS) Providers

* Completed the Division's TB/HIV Goals and Objectives

- Participated in a Bureau brainstorming session re: the feasibility of reporting HIV infection
- Dr. DeMaria conducted 2 seminars in collaboration with the AIDS Program re: TB/STD/HIV in the Health Care Setting
- Submitted a proposal to CDC for a TB/HIV Risk Factor Data and HIV Serostatus Surveillance Project
- Completed a HIV Prevention CDC survey for TB clinics

SUMMARY:

A review of current TB case records indicates that only 17% of the 1991 Massachusetts TB cases are known to have been offered HIV testing and counseling. If it can be assumed that all clients who utilize the state TB Clinics are at risk for HIV, then clearly, this lack of HIV counseling and testing needs to be addressed. The question remaining, however, is whether we can in fact, make this assumption. Prior to developing a service model for TB/HIV counseling and testing, a number of questions need to be answered relative to HIV risk assessment and the actual provision of HIV counseling and testing on site or by referral. Some of these include: the number of TB clients who know their HIV status when first seen at the clinic, the high risk population groups attending the clinics, what percent of clients are HIV positive, how many clients currently ask for or are referred for HIV counseling and testing?, etc.

In order to address the risk assessment aspect of these questions, the AIDS Bureau provided limited funds in early 1991 for a consultant to design and implement a three month pilot study of HIV risk for all clients at 4 selected State TB Clinics: Baystate Medical Center in Springfield, Brockton Hospital in Brockton, St. Luke's Hospital in New Bedford, and Lawrence General Hospital in Lawrence. An HIV Risk Assessment tool was developed and data collection has been completed. Since 7/90, federal funding has been provided to offer HIV testing as part of a survey of risk behavior to all persons with known or suspected TB at the Boston City Hospital site. Data from the BCH project suggest that IDU is the most common HIV risk factor seen among TB clients at the BCH TB Clinic.

A draft report of the HIV Risk Assessment Pilot Study has been completed. Preliminary results are as follows: the majority of respondents were in the 20-49 year age group; slightly more than 50% were male; more than 50% were persons of color; almost 50% were born outside of the United States; a significant number of clients at these sites had already been tested for HIV prior to coming to the TB clinic; 10% had a history of IDU (questions associated with HIV risk factors had the lowest response rate however); and each site varied considerably across the measured parameters. The report from the AIDS Bureau recommends a continuation of this study for an additional 9 months, as further data is needed from these sites in order to establish a truly representative picture of the TB clients at these clinics. In addition, the data collection instrument needs further revision and the data collection process needs to be better standardized. The Division supports these recommendations. Any planning relative to the provision of HIV counseling and testing at our clinic sites (outside of the BCH site where some data is already available), hinges on our being able to demonstrate that our high risk clients for TB/HIV are, in fact, being seen at these clinics. If they are not, as the data from the Class II blinded seroprevalence testing at the Cambridge Clinic would appear to suggest, then our prevention efforts should be targeted to Community Health Centers or other areas where these clients may be more likely to access the health care system.

The second area which needs to be addressed is the provision of HIV counseling and testing to high risk clients at these identified access sites. Currently, resources are available for HIV counseling and testing through all of the TB clinic sites. Each TB Clinic can refer TB clients who are in need of testing or who request HIV testing to the individual hospital HIV testing service or other appropriate public or private testing site (anonymous or confidential). There are great variations, however, as to how this is done at each site and there are no staff persons sited at these clinics to do the counseling and testing at the clinic. Once a more complete profile of risk can be established through the risk assessment procedures, then decisions can be made as to where to offer a more formalized, structured HIV pre and post test sessions.

The one exception to this, is the BCH TB Clinic where there is data on risk assessment as well as the percent of clients attending the TB Clinic who are HIV positive (26% of the Class III and V TB clients). This clinic has been able to demonstrate that HIV counseling and testing can be integrated into the TB clinic structure.

Although only 17% of TB cases in 1991 were known to be HIV-related, because HIV infection is not reportable in Massachusetts, this is only the tip of the iceberg. Given this and the fact that persons who are HIV infected and newly infected with tuberculosis are at greater risk for rapid progression to active tuberculosis, a concerted effort has been made to address TB/HIV issues over the last 5 years. The Division has made great strides in developing strategies for reaching our goals and objectives for the TB/HIV infected. The first Task Force to address this problem was convened in 1985 and there are now four distinct areas where our TB/HIV activities are focused: Surveillance, Containment, Prevention and Education.

PERSONS IN CORRECTIONAL FACILITIES:

* Worked with the Department of Corrections (DOC) to continue to provide TB testing and follow-up protocols for their facilities

* Worked with the DOC Management Information System to establish the TB Database System for all correctional sites

- Worked with the DOC management to get the TB screening recommendations on the table as a bargaining issue for correctional facility employees

- Presented a paper "Implementation and Results of a Surveillance System in a State Correctional System" at the Northeast Epidemiology Conference

- Continued the Division data tracking system for TB cases and suspects in correctional facilities

- Continued prison site visits to evaluate ventilation, UV, isolation capacity and other methods currently in use to prevent potential transmission of tuberculosis

- Responded to several requests for legally required information from DOC and inmate parties as a result of the massive screening of all inmates last year.

- Set up inservice trainings for the Plymouth County House of Correction employees

- Wrote "Recommendations for Isolation for Airborne Infections - Massachusetts Prison Facilities"

- Maintained surveillance tracking systems and state TB database for cases in correctioonal facilities

SUMMARY:

In 1990, the Division targeted inmates of the state correctional facilities for screening and preventive therapy initiatives. This focus came as a result of an outbreak of tuberculosis at one of these facilities. During an intensive 8 week period in late 1990, 12,000 inmates and staff were screened with PPD and anergy tests and mechanisms for followup were developed for all inmates who needed referral for further testing and preventive therapy.

Issues remaining to be addressed include the implementation of annual TB testing for all employees, the development of a TB/HIV educational module (and a "train the trainers" session) for routine in-services to be required of all new DOC employees upon hire, and a skin testing certification program. In addition, the Division has only begun to focus on the county jail system and considerable work remains in the area of education and screening followup at these sites.

CHILDREN:

- Continued the database which tracks cases and suspects in children

- Completed revisions to the Office for Children Day Care Manual

- Completed revisions to the Department of Public Health Camp Regulations
- Gave an in-service on pediatric tuberculosis to the maternal and child health nurses from Community Health Centers funded through the Public Health Region I Office

SUMMARY:

The Division was recently contacted by the state WIC Program. The entire WIC system has recently been computerized and tuberculin screening information is being entered into the System (along with immunization data). The WIC Program would like to work with the Division to train all WIC Directors and local program staff about the tuberculin skin test, its meaning, the needed referrals for positive tests and follow-up. This collaborative effort will mean that TB screening information will be available for 86,000 children currently enrolled in the WIC Program in Massachusetts and a mechanism for education and referral will be provided. With adequate resources, each child who tested tuberculin positive could then be followed to ensure initiation and completion of preventive therapy.

Although the number of cases of tuberculosis in children is not large, the Division is concerned about the very high prevalence rates of tuberculosis infection that have been demonstrated in several surveys of school children in high risk communities in Massachusetts. For example, the City of Boston has been mantoux testing students in the 7th and 10th grades for the past 4 years and published results from this testing indicate that tuberculin positivity in 10th graders in that city is 8.9% (the majority of whom were foreign born students). In Chelsea, Lawrence and Lowell, three other high risk cities for tuberculosis, a study performed by the Division indicated that overall positivity rates in the 3 grades studied were between 4-9% and again, the majority were foreign born students. Given that these children represent both a pool of infected persons who need preventive therapy, and one which represents tuberculosis infection acquired by way of recent exposure, the Division is analyzing new initiatives to target this group and their parents for screening and preventive therapy.

OTHER HEALTH CARE FACILITIES

- Met with the Division of Health Care Quality to begin to strategize methods of addressing the recent information about TB transmission in these facilities
- Distibuted the MMWR recommendations to various health care providers
- Published a chapter on TB transmission in Essentials of Modern Hospital Safety

SUMMARY:

The Division's TB Control Officer, Dr. Edward Nardell, has developed expertise in the area of TB transmission and its control in health care facilites, using environmental precautions. In June 1989, the Division circulated guidelines to help reduce the risk of TB transmission associated with aerosolized pentamidine therapy and other cough generating procedures. These were the first such guidelines and were widely circulated throughout the United States. They have since been updated and this information, along with other CDC materials, is regularly supplied upon request. The Division also participated in an American Lung Association sponsored postgraduate symposium on Infection Control in Hospitals.

Given the current issue of nosocomial transmission of multi-drug resistant tuberculosis in health care settings in New York and other areas of the country, the Division is concerned that a similar situation may occur in Massachusetts. Although our rate of drug resistance varies from 10 to 20% of our culture confirmed cases in any given year, there have already been instances where a multiple resistant TB case has resided in a HIV high risk setting. One of these was in a hospice for HIV infected persons and the other was in an HIV chronic care unit. Clearly the potential for an explosive situation resembling that of other areas of the country exists here as well. A proposal to address this problem, has recently been funded by CDC.

6. **Cases Related to Outbreak Situations:**

Arlington outbreak: 1984 -1991; Total cases to date - 17 cases, with the majority of cases from 1984 - 1988; however, 3 new cases were identified in 1990 (one reactivated). This was primarily an outbreak among white persons and was related to workers and contacts at a restaurant.

Brockton school outbreak: 1990 -1991; 4 cases; three teenagers in an English-as-a-Second-Language class, and a household contact (9 yrs), black Cape Verdean population. Outreach Worker intervention and administration of preventive therapy to school contacts by the school nurse probably prevented this outbreak from spreading further.

Greenfield outbreak: 1990 -1991; total cases to date - 6 (1991 - 1, 1990 5). Outbreak began in a family shelter with a woman and her two preschool children. Other cases were family and close contacts outside of the shelter.

Pittsfield outbreak: 1991 - 5 cases. Source case was a black male, substance abuser, who was a reactivated case of TB. His first diagnosis was in 1989 in New York; other cases are close contacts; population - black substance abusers.

Springfield Nursing Home Outbreak: 1991 - 4 cases and one suspect. First two cases were roomates and were diagnosed at death. Other two cases were a nurse's aide who cared for the patient, and a relative.

7. **OTHER EDUCATIONAL ACTIVITIES:**

a) **MAILINGS**

* Conducted periodic mailings to all clinic staff

* Distributed materials from the Advisory Council for the Elimination of Tuberculosis and CDC to various designated groups

* Wrote the TB section of a Bureau letter to Boards of Health re: reporting requirements

* Mailed a Mumps control antigen advisory to all TB clinics and contracted sites

b) **MATERIAL DEVELOPMENT/IMPLEMENTATION**

* Reviewed the Brooklyn ALA "TB Rap Video" and began using it at the Boston City Hospital TB clinic

* Reviewed the Mississippi Personal Safety Guide and obtained permission for its use for outreach staff

* Responded to numerous requests for TB educational materials and audio visual aids

* Prepared TB charts and graphs for the Commissioner's Office

* Wrote a UV Light Fact Sheet and Installation Guidelines and Principles

* Updated the Preventive Therapy Quiz to account for the change in TB skin test interpretation

* With the assistance of the RHP, reviewed the Utah TB Skin Test video in Polish, Russian, Vietnamese and Cambodian as to its feasibility for use as a TB educational tool

c) **GENERAL TRAINING/LECTURES**

* Participated in the first annual Bureau of Communicable Disease Control update seminar "Risk Management and Communicable Disease Control in the 90's". Over 200 persons attended.

* Conducted a joint workshop with the RHP for outreach workers in both Programs re: assignments, prioritizing activities, clinical review and update, and skin test guidelines

* Conducted a joint training with the RHP for outreach

workers to teach them how to do TB skin testing. The course included a supervised practicum and pre and post testing

* Conducted inservices at the following hospitals: St. Anne's in Fall River, the Maine Medical Center, and St. Luke's Hospital in New Bedford

* Conducted inservices at the following health care sites: Northampton VNA and Home Health Aides, TAC Home Health Care Services (2),and Goddard Medical Associates

* Lectured to Directors of Health Services for all state Community Colleges in Massachussetts

* Lectured to the Harvard School of Public Health - School of Tropical Hygiene (2)

* Collaborated with the ALAM/ATS on a 2 day TB seminar planned for the early winter, 1992

* Funding was obtained to send 2 nurses to the Denver TB update course

* E. Nardell and L. Singleton were selected to present "Meet the Professor" seminars at the 1992 ATS/ALA Annual Meeting

d) **MEDIA/PUBLIC RELATIONS**

* TB Articles were published in numerous papers including the Boston Globe, the Herald, the Springfield Union, etc.

* TB spots were televised on Channels 4, 5, 38, and 56

* Dr. Nardell appeared on a cable TV health show focusing on tuberculosis

e) **ABSTRACTS/PAPERS PRESENTED**

* American Thoracic Society/ALA 1991 Annual Meeting:

"Widespread TB Transmission Within a Prison and Screening of the Entire Prison Population" (S. Etkind, et al.)

"HIV Seroprevalence in Asymptomatic, PPD +, Class II, Predominantly Non-White, Foreign Born Inner City TB Clinic Population' (E. Nardell, et al.)

"We Have to do What? Educating and Screening 12,000 Persons in Correctional Facilities in 4 Short Weeks" (J. Boutotte, et al.)

"So You Think You Know What's Happening in Your TB Clinics....early Benefits from the CDC Compliance Study in Massachusetts" (R. Leib, et al.)

"Funding for Tuberculosis Care for the Homeless: Is It a Priority?" (S. Etkind, et al.)

"Hospitalize Difficult TB Patients - Yes! A Model for In-Patient TB Care in the 90's" (L. Singleton, et al.)

"Do's and Don'ts of UV Air Disinfection" (E. Nardell, et al.)

f) **ABSTRACTS ACCEPTED**

* American Thoracic Society/ALA Annual Meeting, 1992

"TB Nurse Elimination: Implications for Future TB Control in the United States" (S.Etkind, et al.)

"Implementation and Results of a TB Surveillance System in a State Correctional System" (J. Boutotte,et al.)

Refugee Health Program " PPD Positivity Among Soviet Refugees - TB Infection or BCG Effect?" (J. Cochran, et al.)

g) **ARTICLES PUBLISHED**

"Airborne Infection: the Theoretical Limits of Protection Achievable by Building Ventilation" (E. Nardell, et al) for the American Review of Respiratory Diseases, 144:302-306, 1991

"Nosocomial Tuberculosis in the AIDS Era: Strategies for Interrupting Transmission in Developed Countries" (E. Nardell) for the Bulletin of the International Union Against Tuberculosis and Lung Diseases, 1991

"Treating Hard to Treat Tuberculosis Patients in Massachusetts" (S.Etkind, et al) for Seminars in Respiratory Infections - 1991, 6:273-282

"Airborne Infections in Nursing Homes" (E. Nardell, et al.) in Respiratory Infections in the Elderly - 1991

h) **ARTICLES/CHAPTERS ACCEPTED FOR PUBLICATION**

"Tuberculosis Transmission and Pathogenesis" (E. Nardell et al.) in Lung Biology in Health and Disease series Vol xx - (in press)

"Tuberculosis Contact Tracing" (S. Etkind) in Lung Biology in Health and Disease series Vol xx - (in press)

"Respiratory Infections Among the Economically Disadvantaged" (E. Nardell) in Respiratory Infections - a Scientific Basis for Management - (in press)

"Nosocomial Tuberculosis Transmission" (E. Nardell) in Essentials of Modern Hospital Safety (2nd Edition) - (in press)

- Completed the CDC Program Management Reports which analyze cases, contact and preventive activities

- Completed the 6 month Progress Report and Annual Report of the TB Division

- Held 2 staff retreats to formulate and evaluate progress on the Division goals and objectives

- Completed required employee performance evaluation activities

SUMMARY:

A. CDC REPORTING REQUIREMENTS:

1. TB PREVENTION AND CONTROL/ELIMINATION:

a. Program Management Reports:(Program Management Reports exclude data on Boston residents as the Boston TB Program completes these reports separately)

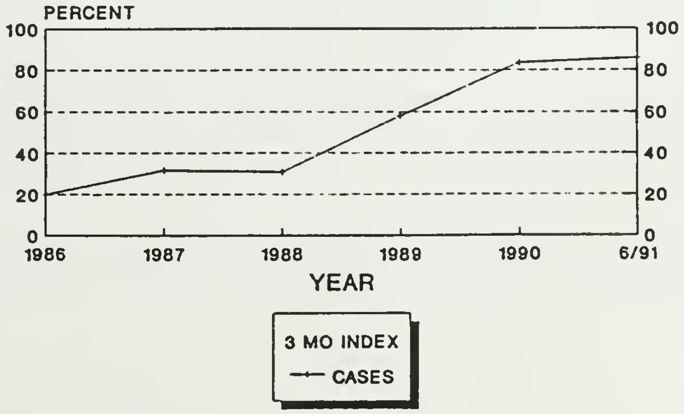
1) **Statistical Data**
2) **Discussion of Program Management Reports**

Objective 1: Sputum Conversion Report

At least 90 percent of all initially infectious patients will become noninfectious (convert their sputum from positive to negative) within three months of starting treatment.

Data for the period of January through June 1991, indicate that an average of **85.7 percent** of all initially infectious patients converted their sputum from positive to negative within three months of starting treatment (excluding those persons who did not have a repeat sputum done). When analyzed over time, the reports indicated that Massachustts has continued to improve on this objective. **THIS OBJECTIVE HAS BEEN NEARLY REACHED.**

MASSACHUSETTS SPUTUM CONVERSION
REPORT (EXCLUDING BOSTON)
1986-6/91



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PART III:

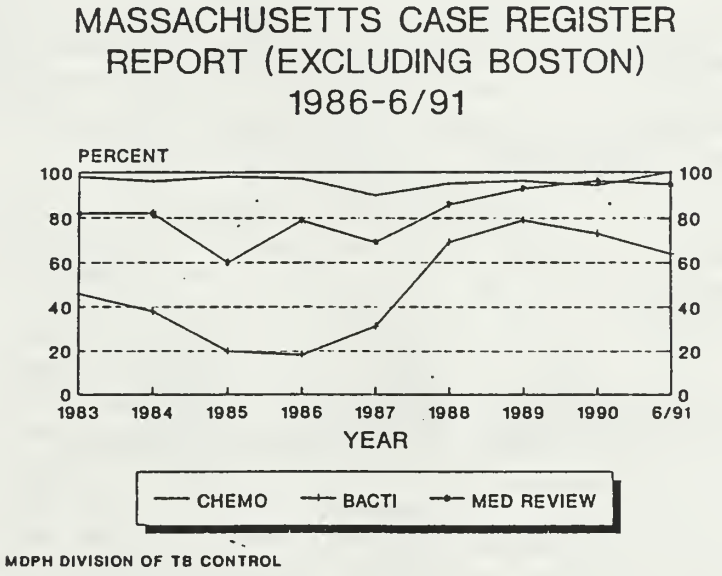
EVALUATION ACTIVITIES:

Outreach Workers have been encouraged to collect sputums on the cases they are following as a way of improving this objective. In addition, the Division of Tuberculosis Control is continuing to perform a needs assessment and evaluation of our clinic system in preparation for the Request for Proposal process which has been delayed until FY 1993. Part of this process includes drafting Divisional TB Clinic Guidelines and policies. An initial draft has been completed and it includes very specific directions for clinic monitoring of sputum status and quality assurance reviews of these clinic practices to be conducted periodically by our Divisional staff.

Objective 2: Case Register Report

At least 90% of patients for whom two or more drugs are recommended will be on current chemotherapy.

The report for the period of January 1,1991 to June 31, 1991, indicates that **100 percent** of tuberculosis patients for whom two or more drugs were recommended, were on current chemotherapy, indicating that **THIS OBJECTIVE HAS BEEN EXCEEDED** for the Commonwealth, excluding Boston.


MASSACHUSETTS CASE REGISTER REPORT (EXCLUDING BOSTON) 1986-6/91

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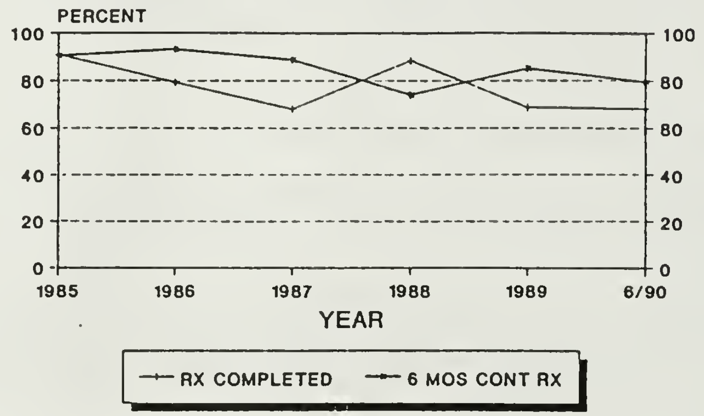
Objective 3: Drug Therapy Report

At least 90 percent of newly diagnosed cases of TB will complete an American Thoracic Society/ Centers for Disease Control (ATS/CDC) recommended regimen of antituberculosis drug therapy.

Data for Massachusetts, excluding Boston, for persons being diagnosed during the period of January through June 1990, indicate that **98%** of the cases continued on therapy for the initial 6 month period. **Eighty-five percent** of persons starting therapy completed a recommended course of treatment within 12 months.



MASSACHUSETTS DRUG THERAPY
REPORT (EXCLUDING BOSTON)
1985-6/90

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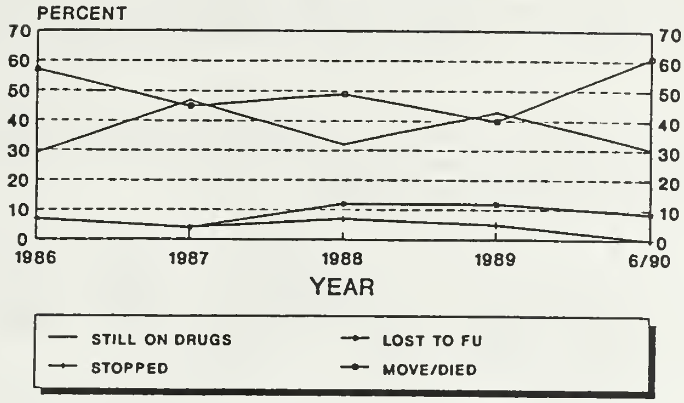
Thirty percent of those cases not completing therapy were still on medications, and are under current supervision. Of those cases still on medication, 29% are drug resistant cases still on medication for prescribed regimens requiring more than 12 months of treatment.

The reasons for noncompletion of therapy in the remainder of those cases not completing a recommended course of therapy within 12 months are as follows: 39.1% died, 21.7% moved with records referred, 8.7% were lost to followup.

When analyzed over time, the data suggests that the percent of cases completing therapy decreased from 1986 - 1989; however, it is clear that if we exclude those categories over which the Division has little control (died, moved, longer therapy due to drug resistance, etc.), then **88%** of the cases actually completed therapy and **THIS OBJECTIVE HAS NEARLY BEEN MET**. In 1991 the Division changed its way of prioritizing personnel assignments to focus more attention on cases than on prevention: the effects of these actions will not be apparent until the drug therapy outcomes for the 1991 cases are analyzed one year following initiation of treatment.

MASSACHUSETTS CASES NOT COMPLETING THERAPY (EXCLUDING BOSTON)
1986-6/90



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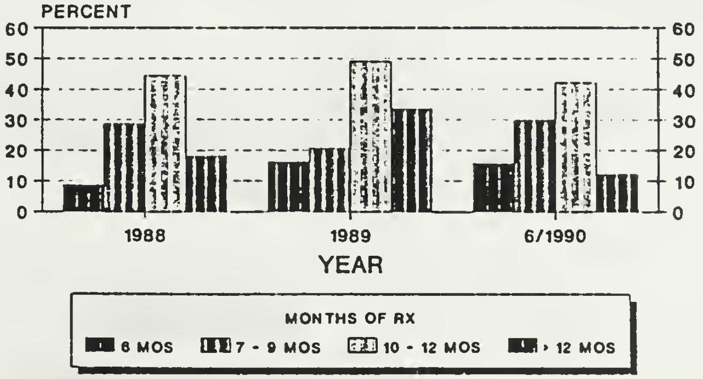
When drug treatment regimens are analyzed over time, it is clear that although the percent of cases prescribed six months of treatment has increased slightly, the majority of cases are still receiving 12 months of treatment. As a result the Division has taken steps to encourage the use of 6-month treatment regimens when not otherwise contraindicated.

TREATMENT REGIMENS OF TUBERCULOSIS CASES MASSACHUSETTS (EXCLUDING BOSTON)
1988 - JUNE 1990 *



• YEAR THAT TREATMENT BEGAN
MDPH DIVISION OF TB CONTROL

Objective 4: Contact Report

At least 95 percent of close contacts to infectious TB cases will receive examinations, with at least 95 percent of infected contacts under 15 years of age and 75 percent of infected contacts 15 years of age and over placed on preventive treatment.

Data for Massachusetts, excluding Boston, for contacts to TB cases during the period of January through December 1990, indicate that **94 percent** of close contacts to infectious cases who were identified were examined. This is a 3% increase from the last report period. **THIS PART OF OBJECTIVE 3 HAS BEEN NEARLY MET.**

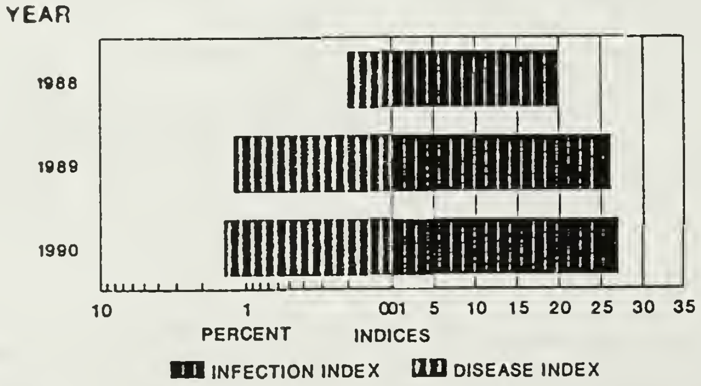
Of infected contacts under 15 years of age, **93 percent** were placed on preventive therapy, indicating that **THIS PART OF OBJECTIVE 3 HAS BEEN NEARLY MET.**

Of infected contacts over 15 years of age, **73.9 percent** were placed on preventive therapy. This was a 24 percent increase over the last reporting period. **THIS PART OF THE OBJECTIVE HAS BEEN NEARLY MET.**

A new reporting system was developed for tracking contacts in 1991 and it is expected that further progress will be made with this objective the next reporting period.

Many of our outbreaks in 1991 were among high-risk contacts. Of concern is the number of growing household clusters of cases seen over the last two or three years, but not really classified as outbreaks. An analysis of this Contact Report indicates that the infection and disease indices has been increasing, suggesting that cases and/or contacts have not been identified earlier enough. In 1990, 28.5% of examined contacts were infected and 1.4% had TB disease. What is not apparent is the number of cases that were contacts to cases more than a year ago--this data would only be available through a retrospective preventive study.

TUBERCULOSIS CONTACT INFECTIVITY INDICES
MASSACHUSETTS (EXCLUDING BOSTON)
1988 - 1990



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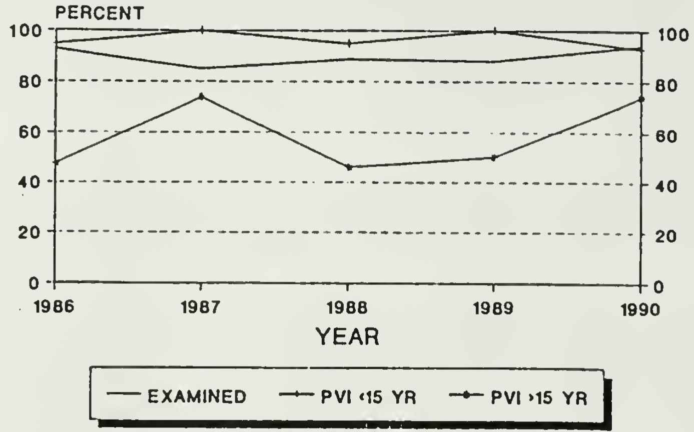
MASSACHUSETTS CONTACT AND OTHER INFECTED
PERSONS REPORT (EXCLUDING BOSTON)
1986-1990



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Objective 5:

At least 90 percent of infected contacts under the age of 15 placed on preventive therapy will complete a minimum of 6 continuous months of preventive therapy. At least 75% of infected contacts 15 years of age and older placed on preventive therapy will complete a minimum of 6 continuous months of preventive therapy.

Unfortunately, due to lack of resources and other higher priorities (case containment), we have been unable to complete a Preventive Report since 1989.

APPENDICES

APPENDICES

1. TB "High Risk" City List
2. Case Rates by Community
3. Age/Sex Table
4. Disease Site List
5. Multiple Site List
6. Age/Race/Ethnicity Table
7. Place of Birth List
8. Drug Resistance List by Drug
9. Drug Resistance List by TYpe
10. Drug Resistant cases by Country of Origin
11. TB/AIDS Case Characteristics
12. TB/AIDS Disease Site List
13. List members Massachusetts Commission for the Elimination of Tuberculosis
14. TB Clinic List
15. High Risk Group List

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF TUBERCULOSIS CONTROL

Seven-Year-Mean Case Rates for Communities with above State Average Tuberculosis Case Rates (per 100,000 population) for 1985 - 1991

COMMUNITY	1991	1990	1989	1988	1987	1986	1985	7-Year Mean
Arlington	6.72	9.36	13.86	8.70	8.66	0.00	19.72	9.57
Boston	24.55	25.95	24.77	24.95	24.21	24.71	26.98	25.16
Brockton	23.71	21.66	10.30	15.15	12.16	13.56	4.17	14.39
Cambridge	10.44	15.87	28.11	10.75	19.27	15.13	24.86	17.78
Chelsea	34.83	15.77	15.56	16.06	16.10	11.51	19.19	18.43
Fall River	16.18	5.60	8.92	6.69	5.58	4.35	5.43	7.54
Fitchburg	14.57	17.85	22.92	15.79	13.19	13.18	7.55	15.01
Framingham	9.23	11.00	15.68	9.26	7.77	4.66	3.08	8.67
Holyoke	2.29	9.64	7.17	7.04	23.50	6.96	0.00	8.09
Lawrence	15.67	9.59	6.38	6.50	9.76	7.76	7.76	9.06
Leominster	5.24	5.68	19.91	2.85	11.40	17.10	2.89	9.30
Lowell	11.60	15.95	12.78	13.98	10.75	18.19	14.98	14.03
Lynn	7.39	16.63	5.11	5.24	21.00	11.35	10.09	10.97
Malden	14.85	9.39	11.26	7.84	1.94	1.94	7.46	7.81
New Bedford	9.01	11.39	12.40	6.22	10.36	11.25	12.28	10.42
Quincy	10.59	3.69	8.57	6.19	7.19	3.59	11.95	7.40
Revere	9.35	11.29	15.86	9.63	7.23	12.04	4.64	10.01
Somerville	18.37	7.01	15.29	13.33	17.28	10.55	7.91	12.82
Springfield	7.01	8.94	6.84	11.86	6.81	11.30	13.29	9.44
Worcester	8.25	7.76	10.29	6.41	5.77	8.33	6.88	7.67
STATE AVERAGE CASE RATE FOR YEAR	7.28	7.43	7.16	6.66	6.92	7.38	7.88	7.24

Appendix 1

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF TUBERCULOSIS CONTROL

Number of Tuberculosis Cases for Boston, 19 High-Risk Communities, and Remainder of Communities Reporting Cases for 1985 - 1991 and Seven Year Average

COMMUNITY	1991	1990	1989	1988	1987	1986	1985	7-Year Average
	Number Cases							
Boston	141	149	142	132	126	141	154	141
PERCENT OF STATE	32%	34%	34%	35%	32%	33%	34%	33%
	Number Cases							
Arlington	*	*	6	*	*	0	9	4
Brockton	22	21	10	15	12	13	*	14
Cambridge	10	14	25	10	19	14	23	16
Chelsea	10	5	*	*	*	*	5	5
Fall River	15	5	8	6	5	*	5	7
Fitchburg	6	7	9	6	5	5	*	6
Framingham	6	7	10	5	5	*	*	5
Holyoke	*	*	*	*	10	*	0	3
Lawrence	11	6	*	*	6	5	5	6
Leominster	*	*	7	*	*	6	*	3
Lowell	12	15	12	13	10	17	14	13
Lynn	6	13	*	4	16	9	8	9
Malden	8	5	6	*	*	*	*	4
New Bedford	9	11	12	6	10	11	12	10
Quincy	9	*	7	6	6	*	10	14
Revere	*	5	7	*	*	5	*	12
Somerville	14	5	11	10	13	8	6	10
Springfield	11	13	10	17	10	17	20	14
Worcester	14	12	16	10	9	13	11	12
TOTAL THESE 19 COMMUNITIES	173	157	171	132	152	140	144	153
PERCENT OF STATE	39%	36%	41%	35%	38%	33%	32%	36%
TOTAL CASES 331 REMAINING COMMUNITIES	124	132	108	118	118	147	159	129
PERCENT OF STATE	28%	30%	26%	31%	30%	34%	35%	31%
TOTAL CASES IN STATE	438	438	421	382	396	428	457	423

* = Less than 5 cases

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	#CASES	RATE/100,000	RANK
BARNSTABLE	2 Communities	3		-
BERKSHIRE	1 Community	1		
	Pittsfield	7	14.40	12

* Only communities with => 4 ranked

MDPH TB DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RAtES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
BRISTOL	6 Communities	12	-	-
	Fall River	15	16.18	8
	New Bedford	9	9.01	21
DUKE		-	-	-

*Only communities with => 4 ranked

MDPH DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
HAMPDEN				
	5 Communities	7	-	-
	Springfield	11	7.01	27
HAMPSHIRE				
	1 Community	1	-	-

*Only communities with => 4 ranked

MDPH DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
ESSEX	8 Communities	12	-	-
	Lawrence	11	15.67	9
	Lynn	6	7.39	24
FRANKLIN	2 Communities	3	-	-

*Only communities with => 4 cases

MDPH DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
MIDDLESEX				
	13 Communities	21	-	-
	Cambridge	10	10.44	17
	Framingham	6	9.23	22
	Lowell	12	11.60	15
	Malden	8	14.85	10
	Newton	6	7.27	26
	Somerville	14	18.37	6
	Waltham	7	12.09	14

MDPH DIVISION OF TB CONTROL

*Only communities with => 4 ranked

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
NANTUCKET	1 Community	1	-	-
NORFOLK	9 Communities	19	-	-
	Quincy	9	10.59	16

Only communities with =>4 cases ranked

MDPH DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
WORCESTER				
	12 Communities	15		-
	Fitchburg	6	14.57	11
	Worcester	14	8.25	23

*Only communities with => 4 cases ranked

MDPH DIVISION OF TB CONTROL

1991 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

	# CASES	RATE/100,000
STATE AT LARGE	6	
STATE TOTAL	438	7.28

MDPH DIVISION OF TB CONTROL

Appendix 3

MASSACHUSETTS 1991
TUBERCULOSIS CASES BY AGE AND SEX

AGE	MALE CASES	MALE PERCENT	FEMALE CASES	FEMALE PERCENT	TOTAL CASES	TOTAL PERCENT
<1 - 04	6	1.4	4	.9	10	2.3
5 - 09	4	.9	0	.0	4	0.9
10 - 14	3	.7	0	.0	3	0.7
15 - 19	8	1.8	7	1.6	15	3.4
20 - 29	43	9.8	34	7.8	77	17.6
30 - 39	53	12.1	42	9.6	95	21.7
40 - 49	44	10.1	21	4.8	65	14.8
50 - 59	28	6.4	18	4.1	46	10.5
60+	70	16.0	53	12.1	123	28.1
TOTAL	259	59.1	179	40.9	438	100.0

MDPH DIVISION OF TB CONTROL

MASSACHUSETTS 1991 TUBERCULOSIS CASES BY PRIMARY DISEASE SITE

SITE	NUMBER OF CASES	PERCENT
Pulmonary	312	71.2
Lymphcervical	40	9.1
Pleural	29	6.6
Bone and/or Joint	8	1.8
Genitourinary	14	3.2
Lymphother	10	2.3
Miliary	6	1.4
Other Site	19	4.4
TOTAL	438	100.0

MDPH DIVISION OF TB CONTROL

TUBERCULOSIS CASES WITH MULTIPLE SITES
MASSACHUSETTS 1991
37 Cases/75 Sites

SITES	NUMBER SITES	PERCENT*
Pulmonary	31	83.8
Pleural	11	29.8
Lymphcervical	6	16.2
Spleen	6	16.2
Miliary	2	5.4
Lymphother	1	2.7
Bonjoi	3	8.1
Brain	1	2.7
Skin	1	2.7
Liver	2	5.4
Gen	6	16.2
Peritoneal	1	2.7
Larynx	2	5.4
Men	2	5.4
TOTAL	75	

MDPH DIVISION OF TB CONTROL

*Percent of Cases with Multiple Sites

1991 VERIFIED TUBERCULOSIS CASES

AGE, RACE, SEX DISTRIBUTION

Age	White Not Hispanic		Black Not Hispanic		Hispanic		Asian/ Pacific Islander		American Indian		Not Specified		Total		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Both
0-4	2	1	2	2	2	0	0	1	0	0	0	0	4	6	10
5-9	1	0	2	0	1	0	0	0	0	0	0	0	0	4	4
10-14	0	0	3	0	0	0	0	0	0	0	0	0	0	3	3
15-19	0	1	4	5	1	0	3	1	0	0	0	0	7	8	15
20-24	0	1	2	6	2	5	9	3	0	0	0	0	15	13	28
25-29	7	4	12	7	5	2	5	6	1	0	0	0	19	30	49
30-34	5	8	14	10	6	2	2	3	0	0	0	0	23	27	50
35-39	7	8	10	3	4	4	5	4	0	0	0	0	19	25	45
40-44	12	4	8	4	5	1	2	2	0	0	0	0	11	28	38
45-54	14	8	11	5	1	3	5	3	0	0	0	0	19	31	50
55-64	15	8	9	5	1	1	7	8	0	0	0	0	22	32	54
65+	34	34	7	1	1	1	10	6	0	0	0	0	40	52	92
Total	97	75	84	48	29	19	48	37	1	0	0	0	179	259	438

MASSACHUSETTS 1991 TUBERCULOSIS CASES BY PLACE OF BIRTH

COUNTRY	NUMBER	PERCENT
UNITED STATES	214	48.9
HAITI	42	9.6
VIETNAM	23	5.3
CHINA	22	5.0
CAMBODIA	18	4.1
DOMINICAN REPUBLIC	12	2.7
CAPE VERDE	11	2.5
INDIA	9	2.1
PORTUGAL	8	1.8
GREECE	6	1.4
ITALY	6	1.4
BRAZIL	5	1.1
KOREA	5	1.1
30 OTHER COUNTRIES	60	13.7
UNKNOWN	1	0.2
TOTAL	438	100.0

MDPH DIVISION OF TB CONTROL

TUBERCULOSIS DRUG RESISTANCE DATA
MASSACHUSETTS 1991

MEDICATION (DOSE)	# CASES	PERCENT
INH (.2) (1.0)	16	34.1
INH (.2) (1.0)/SM	4	8.5
SM	4	8.5
INH (.2)	13	27.7
INH (.2) (1.0)/RIF	2	4.3
INH (1.0)/SM	1	2.1
INH (.2)/SM	1	2.1
INH (.2) (1.0)/RIF/SM	1	2.1
INH (.2)(1.0)/KANA	1	2.1
INH (.2)(1.0)/KANA/CY	1	2.1
KANA	2	4.3
PZA	1	2.1
*TOTAL DRUG RESISTANT CASES	47	100.00

*Includes 1 case whose resistance emerged in 1991

MDPH DIVISION OF TB CONTROL

TUBERCULOSIS DRUG RESISTANCE
MASSACHUSETTS 1991

	# CASES	PERCENT
TUBERCULOSIS CASES	438	100.0
TUBERCULOSIS CASES W DRUG RESISTANCE	46	10.5
BACTERIOLOGICALLY CONFIRMED TB CASES	328	74.9
BACTERIOLOGICALLY CONFIRMED CASES W DRUG RESISTANCE	46	14.0

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Appendix 10

MASSACHUSETTS 1991 DRUG RESISTANT TUBERCULOSIS CASES BY COUNTRY OF ORIGIN

COUNTRY	NUMBER	PERCENT
UNITED STATES	17	36.2
HAITI	8	17.0
VIETNAM	7	14.9
DOMINICAN REPUBLIC	4	8.5
CHINA	2	4.2
INDIA	2	4.2
CAMBODIA	1	2.1
CANADA	1	2.1
CAPE VERDE	1	2.1
GERMANY	1	2.1
HUNGARY	1	2.1
KOREA	1	2.1
MALAYSIA	1	2.1
TOTAL	47	99.7

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Appendix 11

TABLE 1

DEMOGRAPHIC CHARACTERISTICS
Massachusetts TB & AIDS Cases
1982 - December 31, 1991

	Cumulative TB & AIDS cases as of December 31, 1991 n= 228		Cumulative non_TB AIDS cases as of December 31, 1991 n= 4406*	
	No.	% of subgroup	No.	% of subgroup
RESIDENCE				
Boston	109	48%	1674	38%
SMSA	55	24%	1047	24%
Outside SMSA	55	24%	1397	32%
Out-of-state	9	4%	288	7%
TRANSMISSION CATEGORY				
Homosexual/Bisexual	47	21%	2515	57%
IV Drug User	73	32%	962	22%
Homosexual/IVDA	13	6%	171	4%
Blood Transfusion	6	3%	103	2%
Hemophilia	1	0%	59	1%
Foreign born	72	32%	150	3%
Heterosexual Cases	9	4%	186	4%
Pediatric Cases	0	0%	102	2%
Undetermined	7	3%	158	4%
GENDER				
Male	195	86%	3859	88%
Female	33	14%	547	12%
VITALITY STATUS				
Alive	88	39%	1556	35%
Dead	139	61%	2763	63%
Unknown	1	0%	87	2%
RACE				
White	64	28%	3056	69%
Black	130	57%	823	19%
Hispanic	31	14%	493	11%
Other/Unknown	3	1%	34	1%
MEAN AGE AT DIAGNOSIS OF AIDS		35.73		35.54

* Includes AIDS cases reported as of December 31, 1991

MASSACHUSETTS TB/AIDS CASES BY TUBERCULOSIS SITE 1982-1991

228 Patients/293 Sites*

SITE	# of Patients	(%)
Pulmonary	129	44
Pleural	26	9
Lymphatic/cervical	31	11
Lymphatic/intrathoracic	3	1
Lymphatic/other	17	6
Lymphatic/unknown	5	2
Spleen	14	5
Bone/joint	5	2
Liver	5	2
Genitourinary	9	3
Miliary	9	3
Peritoneal	5	2
Meningeal	7	2
Other**	24	8
Unknown	14	5
TOTAL SITES	293	-

*65 patients had multiple positive sites for TB

**other includes brain, pharynx, pericardial and rectal

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MASSACHUSETTS COMMISSION FOR THE ELIMINATION OF TUBERCULOSIS

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Hampden County Sheriff's Department

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American Lung Association, Massachusetts

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John Coldiron, M.D.
Medical Director
Massachusetts Hospital Association

Paul Farmer, M.D., Ph.D.
Director, Partners in Health

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Medical Director, Medicaid Program

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Executive Director, NUVA

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Massachusetts House of Representatives

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH, DIVISION OF TUBERCULOSIS CONTROL

FREE TUBERCULOSIS CLINICS BY TUBERCULOSIS SURVEILLANCE AREAS (TSA's)

TSA 1	CLINIC APPOINTMENTS MADE BY:	
Baystate Medical Center, Springfield	Clinic Coordinator	784-5435
Berkshire Medical Center, Pittsfield	Berkshire Medical Center	443-1619
Franklin Medical Center, Greenfield	VNA & Health Services	774-2302
Harrington Memorial Hospital, Southbridge	Harrington Home Care	765-1515
Holyoke Hospital, Holyoke	Holyoke Health Dept.	534-2186
St. Vincent's Hospital, Worcester	TB Clinic Secretary	798-1113
Family Health & Social Services (Worcester City Hospital), Worcester	Clinic	799-8300
TSA 2		
Cambridge Hospital, Cambridge	Cambridge Health Dept.	498-1291
Framingham Union Hospital, Framingham	Framingham Health Dept.	620-4827
Mass. Respiratory Hospital, Braintree	Local Health Depts.	
Middlesex County Hospital, Waltham	Local Health Depts.	
St. Elizabeth's Hospital, Boston	Mrs. Devin	789-2600
TSA 3		
AtlantiCare Medical Center, Lynn	Lynn Health Dept.	598-4000,X160
Burbank Hospital, Fitchburg	Fitchburg Health Dept.	345-9584
Lawrence General Hospital, Lawrence	Lawrence Health Dept.	794-5884
Lowell General Hospital, Lowell	Lowell Health Dept.	970-4151
Malden Hospital, Malden	Malden Health Dept.	397-7052
Salem Hospital, Salem	TB Clinic	741-1200,X4455
TSA 4		
Dept. of Health & Hospitals, Boston	Health & Hospitals	534-4967
Children's Hospital, Boston	Pulmonary Services	735-7881
East Boston Neighborhood Health Center	Health Center	569-5800
Pine Street Inn, Boston	Pine Street Inn	482-4944, X221
TSA 5		
Brockton Hospital, Brockton	Brockton Health Dept.	580-7175
Cape Cod Hospital, Hyannis	Chester Mohr, M.D.	790-5955
Cranberry Specialty Hospital, Middleboro	Hospital	947-1000
Morton Hospital, Taunton	Health Dept.	821-1408
St. Anne's Hospital, Fall River	Fall River Health Dept.	324-2000, X296
St. Luke's Hospital, New Bedford	New Bedford Health Dept.	979-1400
Sturdy Memorial Hospital, Attleboro	Local Health Depts.	
TSA S		
Lemuel Shattuck Hospital, Boston	Lemuel Shattuck (OPD)	522-8110,X443

MASSACHUSETTS TUBERCULOSIS CASES AMONG HIGH RISK GROUPS

1991

POPULATION	NUMBER	%/TOTAL # CASES
FOREIGN BORN	224	51.1
CHILDREN (<1-14 YRS)	17	3.9
HOMELESS	26	5.9
TB/AIDS	22	5.0
IVDU PERSONS	22	5.0
CHRONIC CARE FACILITY*	15	3.4
PRISON/JAILS	3	0.7
PERSONS W DRUG RESIST.	46	10.5
PERSONS W DRUG RESIST./ KNOWN HIV +	10	2.3

*includes 2 employees

MDPH DIVISION OF TB CONTROL

MASS. HS30.901:992

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

BUREAU OF COMMUNICABLE DISEASE CONTROL

DIVISION OF TUBERCULOSIS CONTROL

ANNUAL REPORT, 1992

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MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

David Mulligan, Commissioner

Alfred DeMaria, Jr., M.D., Assistant Commissioner

DIVISION OF TUBERCULOSIS CONTROL

Sue Etkind, R.N., M.S., Director

Edward Nardell, M.D., Tuberculosis Control Officer

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INTRODUCTION

Massachusetts continues to be among the top 20 states with the highest prevalence of tuberculosis. In 1992, 428 cases (case rate of 7.11 per 100,000 population) were reported and verified. This represents a 1.8% decrease from 1991, however, we have yet to return to the 1988 case rate of 6.6 per 100,000. Groups at higher risk of tuberculosis continue to be; the foreign born, the homeless, injection drug users, the HIV infected, the elderly and all minority groups.

This report, consisting of data from several sources, is a summary and analysis of calendar year 1992 tuberculosis (TB) morbidity. Tuberculosis morbidity information is collected from health care providers; including Health Departments, hospitals, private providers and health care providers in community settings.

The Division of Tuberculosis Control, in conjunction with the local health departments, is charged with all aspects of TB control. This report also highlights Division activities during 1992 in the areas of epidemiology, case management, prevention services, clinical service provision and education and training.

Recognition and our thanks are extended to the field staff, local health department staff, the American Lung Association of Massachusetts, hospitals, nursing homes physicians and the many other providers who are dedicated and committed to tuberculosis control. Through our combined efforts, we can maintain this year's trend of declining cases and reach our goal of TB elimination in Massachusetts.

Sue Etkind

Alfred DeMaria, Jr., M.D. Sue Etkind, R.N., M.S.

Edward Nardell MD

Edward A. Nardell, M.D.

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PART I

TUBERCULOSIS IN MASSACHUSETTS, 1992

1992 TUBERCULOSIS CASES OVERVIEW

NOTE: Except where stated, case rates for 1990 and earlier years were based on population data from the 1980 census; 1991 and 1992 case rates were calculated using 1990 census population data. All case rates are per 100,000 population.

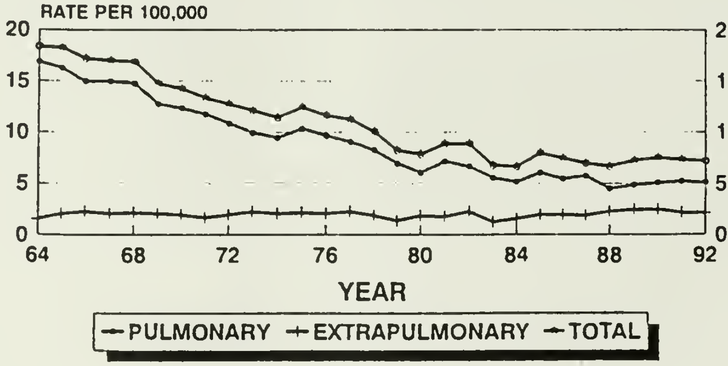
A. DEMOGRAPHIC ANALYSIS

Demographic analysis of the 1992 tuberculosis cases as compared to previous years is as follows:

Massachusetts continues to have an unacceptably high incidence of tuberculosis. In 1992, 428 cases (case rate of 7.11 per 100,000) were reported and verified by the Division of Tuberculosis Control.

Although this represents an encouraging 1.8% **DECREASE** in morbidity from 1991, we have yet to return to the 1988 case rate of 6.6 per 100,000.

MASSACHUSETTS TB CASE RATES
BY SITE AND YEAR
1964-1992



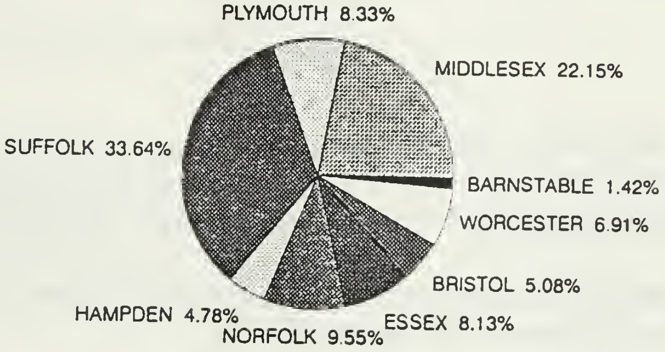
Massachusetts has designated those communities with: 1) a seven-year average of three or more cases per year; and 2) a seven-year mean case rate above the State average, as a "high risk" community. In 1992 there were a total of 22 high risk communities (Appendix 1)- the highest of which was Brockton (23.71 per 100,000). The Brockton case rate **HAS INCREASED BY 130%** since 1989, with an overall increase of 75% over the last seven years. The City of Boston followed with a case rate of 22.29 - a decrease of 9.2% from 1991 and a decrease of 14% since 1990. Two additional cities were added to the "high risk" communities list this year based on their case rates - Brookline (9.14) and Medford (15.68). Substantial increases in tuberculosis cases were also noted in several other high risk communities.

For surveillance and comparison purposes, cities and towns with 3 or more cases are ranked by their case rates (Appendix 2).

Residence:

Suffolk County accounts for almost one third (33.1%) of the tuberculosis cases in Massachusetts, followed by Middlesex County (21.8%). This year two of the fourteen counties in Massachusetts were free of tuberculosis cases (Dukes and Nantucket).

MASSACHUSETTS VERIFIED TUBERCULOSIS
CASES BY COUNTY 1992 (N= 426)*



Dukes and
Nantucket -no
TB in 1992

Percent of Cases

Hampshire-.9%,
Berkshire-.2%,
Franklin-.2%

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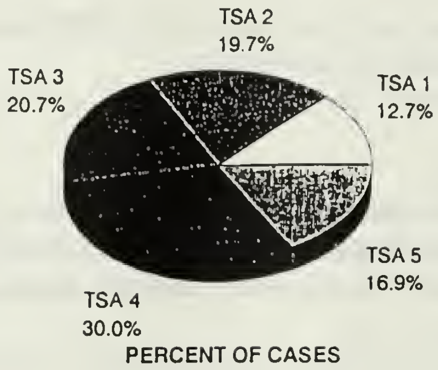
*2 other cases are state at large

If the cases are analyzed by geographic district or Tuberculosis Surveillance Area (TSA), it can be noted that TSA 4 (Boston) accounts for 30% of the total cases (a 6% decrease in 1992, in addition to the 2% decrease in 1991), while the other tuberculosis cases are fairly evenly distributed between the remaining four TSAs: 1 (Western) 13%, 2 (Metro Boston) 19%, 3 (Northeast) 21%, and 5 (Southeast) 17%.

MASSACHUSETTS TUBERCULOSIS CASES BY TUBERCULOSIS SURVEILLANCE AREA (TSA)
1992 (n=426)*



*Excludes 2 cases in correctional facilities

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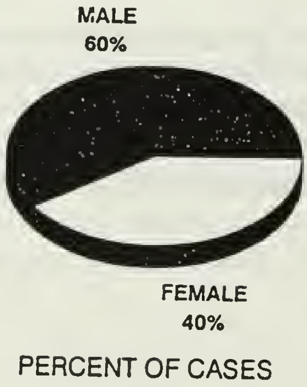
Age and Sex: (Appendix 3)

Of the 1992 tuberculosis cases which met the CDC count criteria, 60% were male and 40% were female (similar to 1991).

MASSACHUSETTS TUBERCULOSIS CASES BY GENDER
1992 (n=428)



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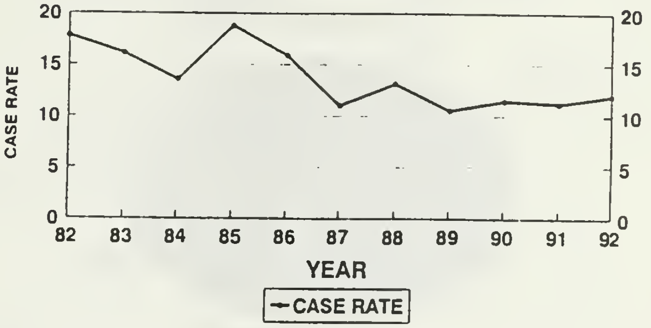
When cases in the elderly are analyzed, it is noted that 23% of the cases in 1992 were age 65 or older (a 2% increase over 1991). When analyzing the trend according to case rates, it is noted that there was a steady downward decline seen from 1982 - 1989. Since 1990, the rate has remained stable at 11-12 cases per 100,000.

RATE OF TUBERCULOSIS IN PERSONS
AGE 65 AND OVER
MASSACHUSETTS 1982-1992



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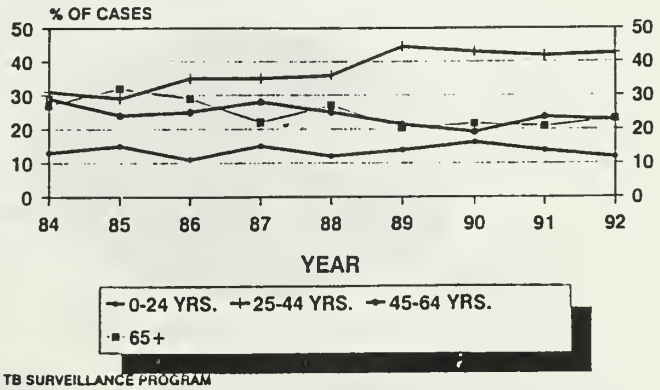
Forty-three percent of the 1992 cases were in the 25-44 year age group. A breakdown of age categories for the last 7 years demonstrates an overall **UPWARD TREND** in this age group, although the trend now appears to be leveling off.

MASSACHUSETTS TUBERCULOSIS CASES
BY AGE GROUP AND YEAR
1984-1992



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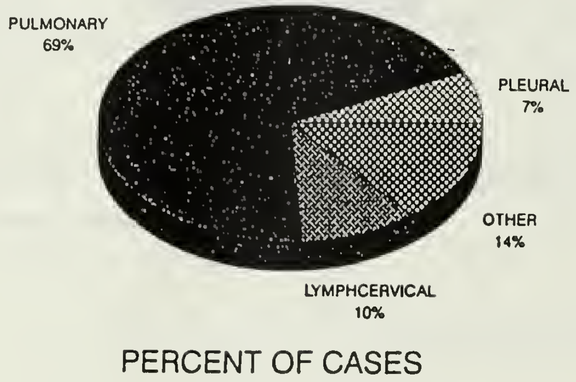
B. CLINICAL CHARACTERISTICS:

Pulmonary versus extrapulmonary (Appendix 4-5)

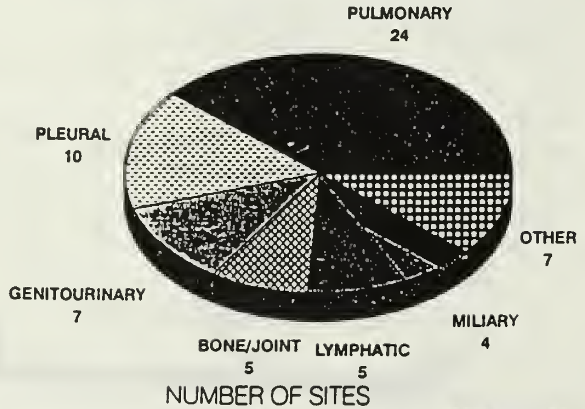
The primary site of disease for sixty-nine percent of the cases in 1992 was pulmonary (a 2% decrease from 1991). This was followed by lymph/cervical (10.3%), pleural (6.6%) and numerous other sites, each less than 3%.

MASSACHUSETTS TUBERCULOSIS CASES
BY PRIMARY DISEASE SITE
1992 (N = 428)



When cases with multiple disease sites are analyzed, it is noted that 82.7% had pulmonary involvement (similar to 1991), with pulmonary site as the primary site in 62.1% of these cases (similar to 1991, but an increase of 15% since 1990); 35% of the cases had a pleural site; 24% had a genitourinary site; miliary, bone/joint and lymphatic sites were each present in 17% of the cases.

TUBERCULOSIS CASES WITH
MULTIPLE SITES*
MASSACHUSETTS 1992



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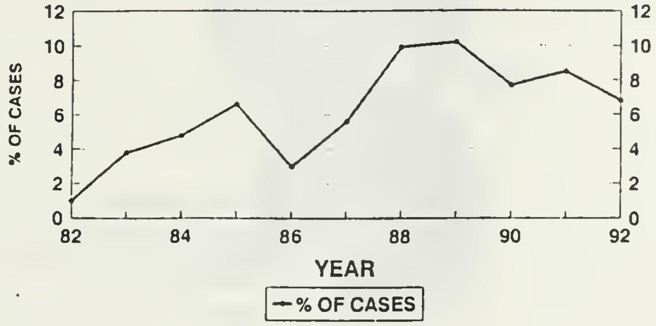
*29 Cases/62 Sites

The upward trend in the percent of cases with multiple sites noted since 1982 appears to have stabilized.

PERCENT OF TUBERCULOSIS CASES
WITH MULTIPLE SITES
MASSACHUSETTS 1982-1992



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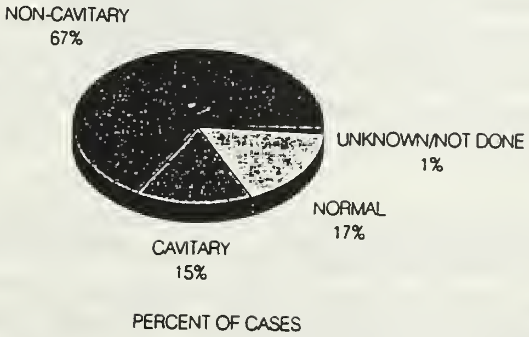
Cavitary versus noncavitary

Sixty-seven percent of the 1992 cases had noncavitary disease, 15% were cavitary **(over 7% decrease over 4 years)**, 17% had normal radiographs, and 1% were unknown or had no chest x-ray done.

MASSACHUSETTS TUBERCULOSIS CASES
BY X-RAY RESULT
1992 (N=428)



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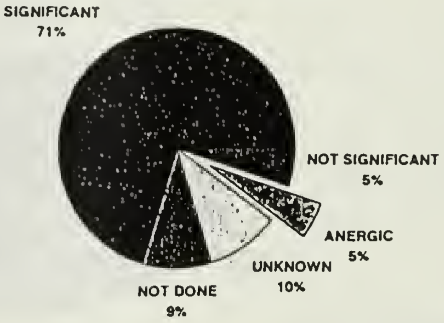
Significant versus nonsignificant skin tests

Seventy percent of the cases in 1992 had positive skin test reactions, 10% were unknown, 9% were not done, 5% were negative and 5% had documented anergy.

MASSACHUSETTS TUBERCULOSIS
CASES BY SKIN TEST RESULTS
1992 (N=428)



PERCENT OF CASES

C. BACTERIOLOGIC CONFIRMATION:

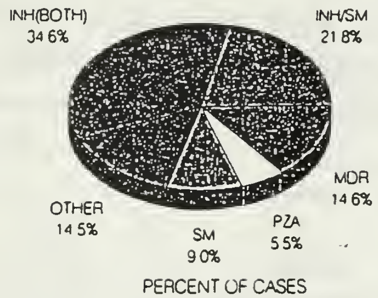
In 1992, 316 cases (74%) were bacteriologically confirmed with a positive culture; this included three cases of disseminated M. bovis disease. This is a bacteriologically substantiated incidence rate of 5.25/100,000.

D. CASES WITH DRUG RESISTANCE: (Appendix 6-8)

NOTE: Drug resistance is defined as greater than 1 percent resistance to any concentration of that drug. In 1992, 55 cases had organisms with such resistance noted on drug susceptibility testing. Multidrug resistance refers to resistance to two or more drugs, (according to the CDC definition, this must include at least Isoniazid (INH) and Rifampin (RIF). In 1992, 11 of the 55 cases met this definition.

In 1992, INH resistance (three concentrations), accounted for 34.6% of the drug resistant cases (**a 27.2% decrease from 1991**), INH and SM resistance 21.8% (a 9.1% increase), Streptomycin (SM) resistance alone 9.2% and other combinations 34.1%. Of concern is that **16.4% OF THE DRUG RESISTANT CASES WERE MULTIDRUG RESISTANT (MDR).**

MASSACHUSETTS TUBERCULOSIS CASES
BY DRUG RESISTANCE
1992 (n=55)*



*5 cases from prior years developed resistance in 1992

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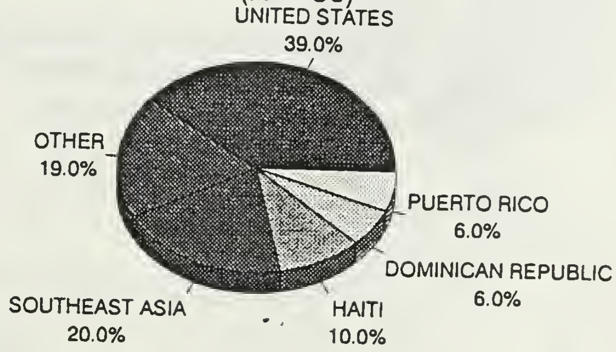
This year 45% of the total drug resistant cases are in the foreign born population **(a 29% increase since 1989)**; an additional 6% were from Puerto Rico. The greatest percentage of these were from Vietnam (25%), followed by Haiti (21%), Cambodia (17%), Dominican Republic (13%) and 10 other countries.

MASSACHUSETTS DRUG RESISTANT
TUBERCULOSIS CASES BY COUNTRY OF ORIGIN
1992 (N = 50) *



PERCENT OF CASES

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* 1992 INCIDENCE CASES ONLY

In 78% of the drug resistance cases, the etiology was unknown, but risk factors were present in 54% of the cases: foreign born 45%, contact to a known case/resistance pattern/history of previous treatment unknown 7%, and health care worker 2%. Sixteen percent of the drug resistant cases have been determined to be acquired (secondary) resistance - **an 11% increase from 1990;** 6% of the cases were primary resistance (homeless 4%, and contact to a case with known drug resistance 2%).

ETIOLOGY OF TB DRUG RESISTANCE
MASSACHUSETTS 1992

ETIOLOGY	# OF CASES	PERCENT
ACQUIRED RESIST	9	16.4
Treatment Failure	7	
Hx of Previous RX	2	
PRIMARY RESIST	3	5.5
Homeless	2	
Contact to Resistant	1	
UNK ETIOLOGY	43	78.1
Contact/Unk Resistance	4	
Health Care Worker	1	
Foreign Born	25	
No Known Risk Factor	13	
TOTAL	55	100

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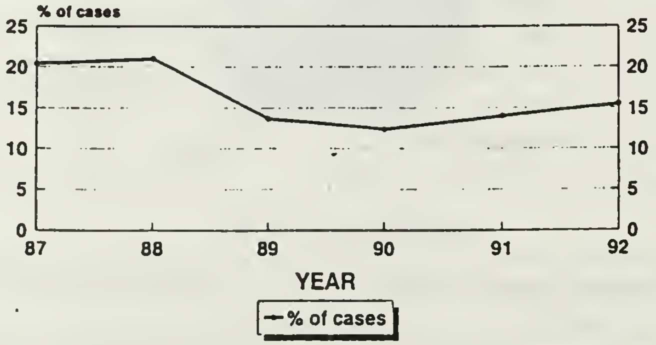
Of concern is the fact that there has been a 6% increase in drug resistance since 1990. This possible trend reversal will require careful monitoring. Also of concern, is that 13% of the drug resistant cases are documented to be HIV positive.

PERCENT OF BACTERIOLOGICALLY CONFIRMED
TB CASES WITH DRUG RESISTANCE
MASSACHUSETTS, 1987-1992



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MULTIDRUG-RESISTANT TUBERCULOSIS (MDR-TB)

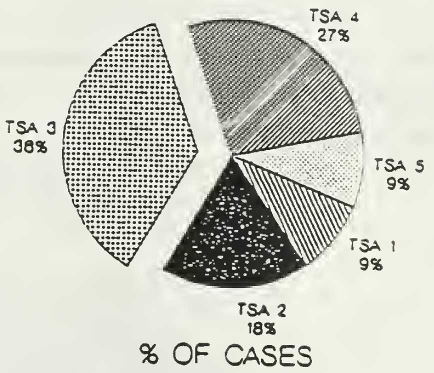
The following analysis is based on MDR TB cases (11) culture positive in 1992. Of these 11, 5 were 1992 incidence cases, 1 was a 1992 incident case from another state, and 5 were cases from previous years, still under supervision. The five 1992 incident cases comprise 1.6% of the bacteriologically confirmed 1992 TB cases.

This analysis excludes persons who are currently under treatment for MDR-TB but did not have a positive culture in 1992. In the future, these cases will be included in the analysis.

Residence:

One way to look at the incidence of MDR-TB is to analyze the cases by place of residence at the time of diagnosis. This reveals a dispersion as the 11 cases involve 8 cities and towns. However, analyzing the State by geographic district (TSA) shows MDR-TB is more prevalent in some regions. TSA 3 and 4 combined account for 64%.

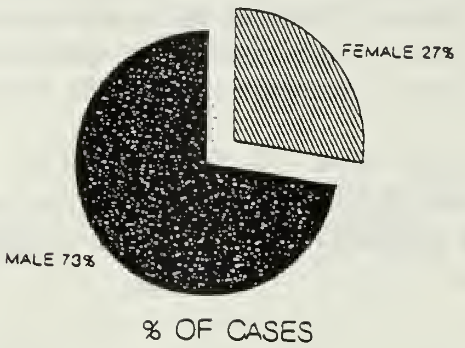
MASSACHUSSETTS MDR-TB CASES
BY TB SURVEILLANCE AREA
1992 (N=11)



Age and sex:

Eight of the MDR-TB cases were male; 3 were female. Age ranged from 19-85. Six (55%) were between the ages of 25-44.

MASSACHUSETTS MDR-TB CASES
BY SEX
1992 (N=11)



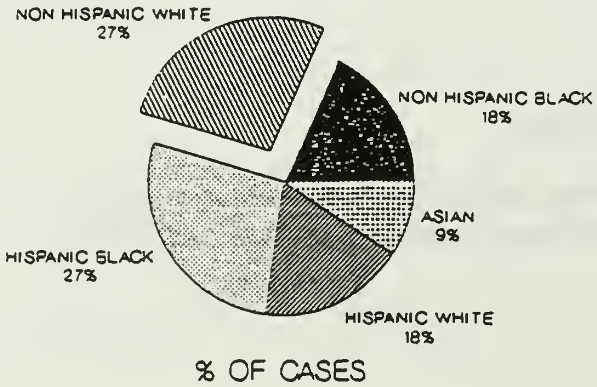
HIV status:

Overall, 5 of the 11 MDR TB cases had a record of being tested for HIV. (Only 4 of the 6 persons between the ages of 25-44 were tested). Due to small cell size, these results cannot be reported here.

Race and ethnicity:

When the race and ethnicity of cases are analyzed, the difference between non-minority cases and minority cases is apparent. Minorities account for over 70% of the MDR-TB cases culture positive in 1992.

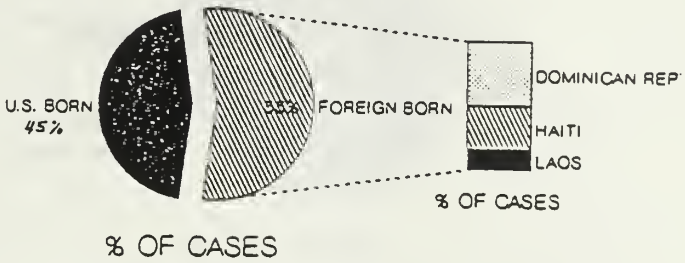
MASSACHUSETTS MDR-TB CASES
BY RACE AND ETHNICITY
1992 (N=11)



Foreign-born:

Persons born in a foreign country have been the highest risk group for TB in Massachusetts for a number of years. Fifty five percent of MDR-TB cases culture positive in 1992 were foreign-born. Countries in descending order were: U.S.A. (45%), Dominican Republic (27%), Haiti (18%), and Laos (9%).

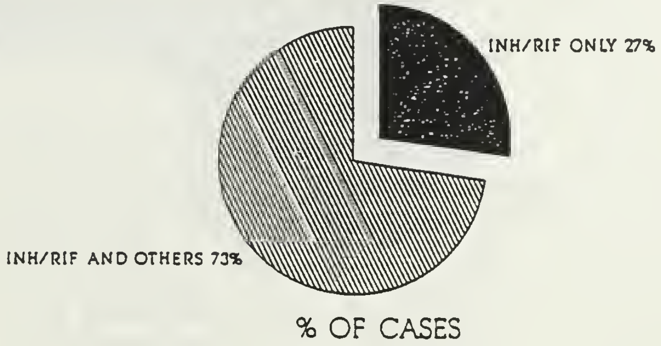
MASSACHUSETTS MDR-TB CASES
BY PLACE OF ORIGIN
1992 (N=11)



Drug Resistance Pattern:

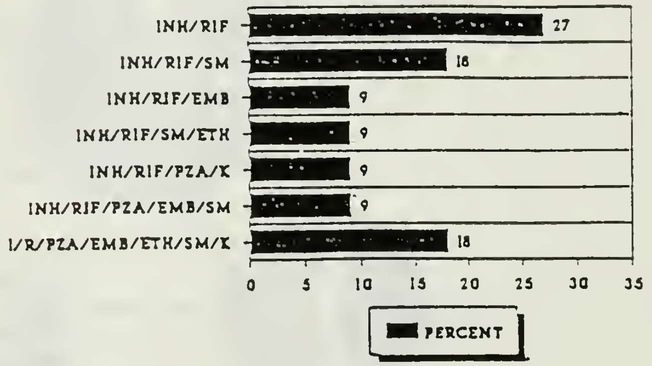
Seventy three percent of the MDR-TB cases show resistance to more than INH and RIF.

MASSACHUSETTS MDR-TB CASES
BY DRUG RESISTANCE
1992 (n=11)



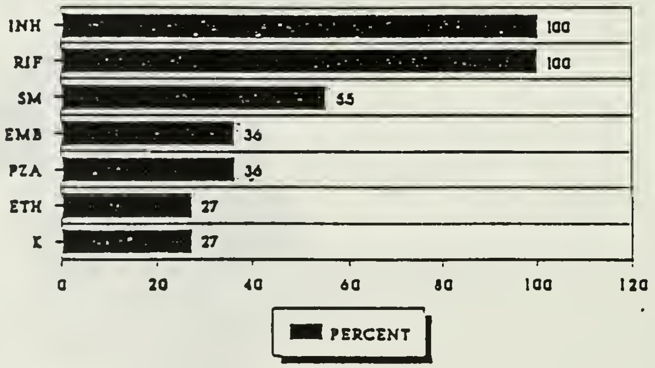
Forty six percent of the MDR-TB cases were resistant to four or more drugs. Eighteen percent of the MDR TB cases show resistance to seven drugs.

MASSACHUSETTS MDR-TB CASES
BY RESISTANCE PATTERN
1992 (n=11)



Another way of looking at the same data is to compare how often a particular dru resistance was present. By definition INH and RIF resistance is present in 100% o the MDR-TB cases. Other drugs were prevalent in the MDR-TB cases as follows: SM - 55%, Ethambutol (EMB) and Pyrazinamide (PZA) - 36%, and Ethionamide (ETH) and Kanamycin (K) - 27%,

MASSACHUSETTS MDR-TB CASES
BY RESISTANCE PATTERN
1992 (n=11)

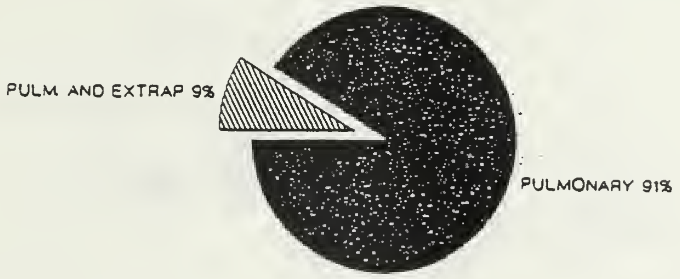


CLINICAL CHARACTERISTICS

Site of disease:

The primary site of disease for all the MDR-TB cases was pulmonary.

MASSACHUSETTS MDR-TB CASES
BY SITE OF DISEASE
1992 (N=11)

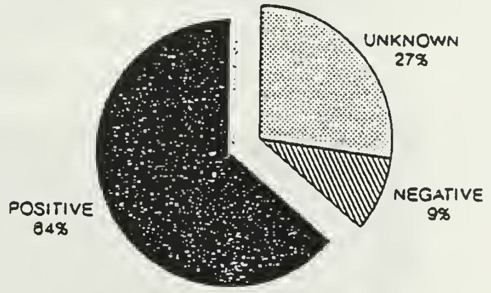


% OF CASES

Significant versus nonsignificant skin test:

The majority (64%) of the MDR cases had a significant skin test, while 9% were negative, and 27% were unknown.

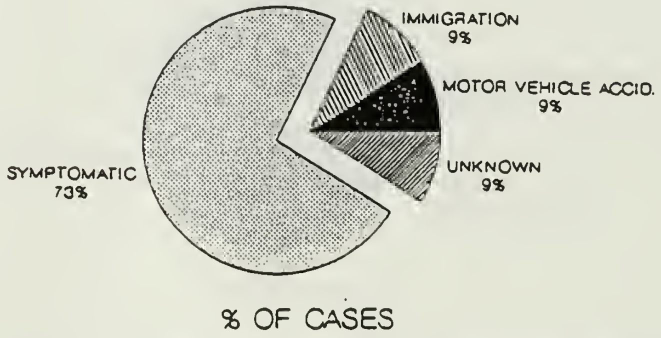
MASSACHUSETTS MDR-TB CASES
BY RECENT PPD RESULTS
1992 (n=11)



% OF CASES

Reason for initial evaluation:

The majority (73%) of the MDR-TB cases were initially evaluated secondary to symptoms. The remaining 3 (27%) presented through immigration screening, post motor vehicle accident evaluation, and reason unknown.

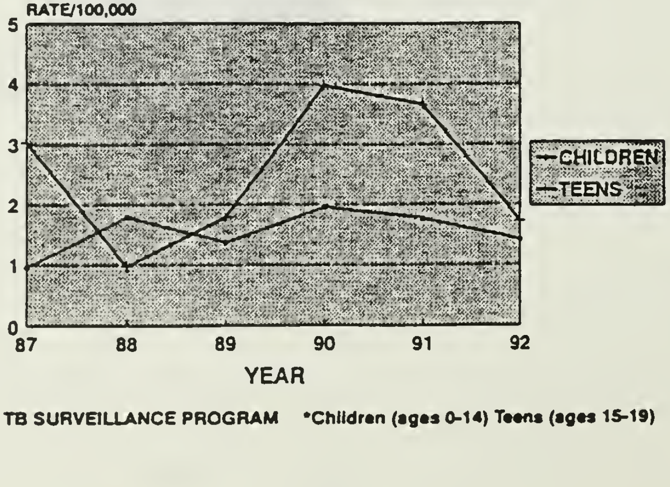

MASSACHUSETTS MDR-TB CASES
BY REASON FOR INITIAL EVALUATION
1992 (N=11)

E. HIGH RISK GROUP PROFILES

1. CASES AMONG CHILDREN 0 - 14 YEARS OF AGE:

The percent of cases in children ages 0-14 years in 1992 decreased from 5.5% in 1990 to 3.7% (similar to 1991); the increase noted in the 15-19 year age group in 1990 decreased from 3.4% in 1991 to 1.7% in 1992. When analyzed over time using case rates, the case rate in children has increased slightly from 0.96 in 1987 to 1.4 in 1992; case rates in teenagers decreased from 3.97 in 1990 to 1.71 in 1992.

TUBERCULOSIS CASE RATE
IN CHILDREN AND TEENS*
MASSACHUSETTS, 1987-1992

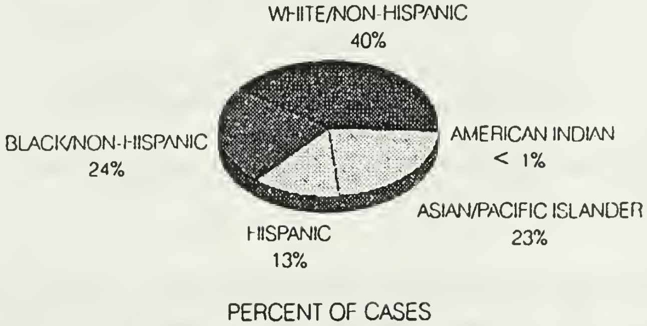


MDPH TB SURVEILLANCE PROGRAM *Children (ages 0-14) Teens (ages 15-19)

2. CASES AMONG RACIAL AND ETHNIC GROUPS: (Appendix 9)

This year, cases in minorities continued to account for **ALMOST 60%** of the tuberculosis cases in Massachusetts (black/non hispanic 24%, hispanic 13%, Asian/Pacific Islanders 23% and American Indians < 1%). This is a **17 PERCENT OVERALL INCREASE IN CASES AMONG MINORITIES IN THE LAST 6 YEARS**, with black/non hispanics representing the greatest increase (over 10%).

MASSACHUSETTS TUBERCULOSIS
CASES BY RACE/ETHNICITY
1992 (N=428)



When the race and ethnicity of cases are analyzed by case rates, the differences between non-minority cases and minority cases is very striking. The **relative risk** for **1992** minority cases as compared to white/non-hispanic cases is: BLACK/NONHISPANIC - 7.0, HISPANIC - 3.5, AND ASIAN/PACIFIC ISLANDER - 12.8. Case rates increased in all groups except for black/non-hispanics.

TUBERCULOSIS CASE RATES BY RACE/ETHNICITY

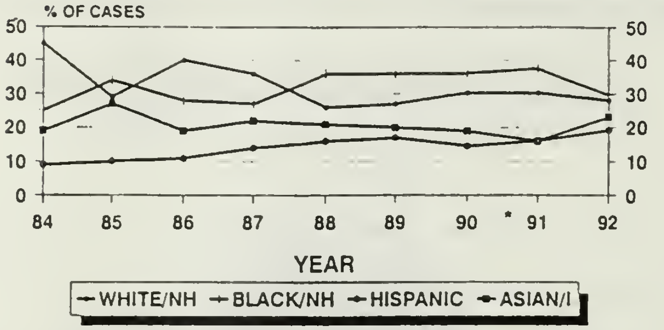
MASSACHUSETTS, 1992

RACE/ETHNICITY	# CASES	CASE RATE	RELATIVE RISK
WHITE, NONHISPANIC	174	5.3	1
BLACK, NONHISPANIC	102	37.16	7
HISPANIC	54	18.78	3.5
ASIAN/P. I.	97	67.65	12.8

Looking specifically at the 25-44 year age group, it can be noted that cases in **MINORITIES ACCOUNTED FOR 72% OF ALL CASES IN THIS AGE GROUP IN 1992** (black/non-hispanic 29.7%, Hispanic 19.2% and Asian/Pacific Islanders

23.1%).

MASSACHUSETTS TUBERCULOSIS CASES
BY RACE/ETHNICITY, AGES 25-44 YEARS
1984-1992*

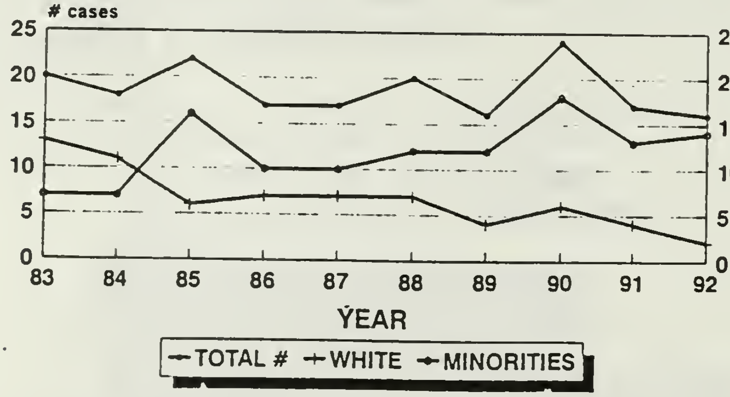


MDPH TB SURVEILLANCE PROGRAM

* excludes 4 American Indian cases

When the 1992 cases in children under 15 years of age are analyzed by race/ethnicity and age group it can be noted that although the proportion of cases in children remained stable, **THE MAJORITY OF CASES IN CHILDREN (88%) WERE REPORTED AMONG MINORITIES - AN 11% INCREASE FROM 1991.**

TUBERCULOSIS CASES IN CHILDREN < AGE 15
BY RACE/ETHNICITY
1983-1992



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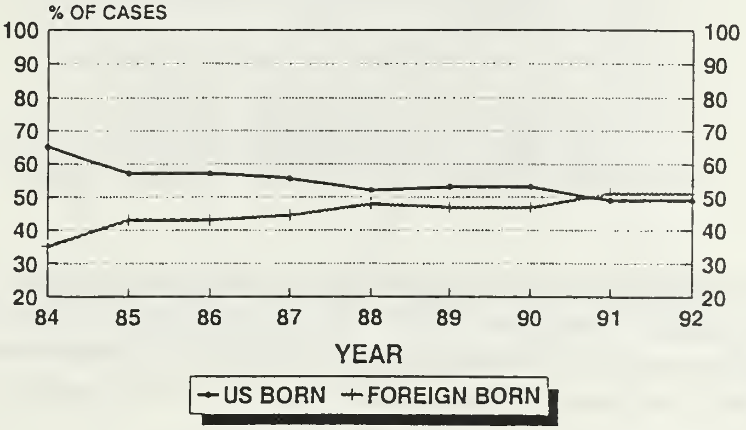
3. CASES IN FOREIGN BORN PERSONS: (Appendix 10)

NOTE: In order to reflect the citizenship status of persons born in Puerto Rico, these persons are categorized as U.S. born.

For the second year in a row, the foreign born cases now account for over half (50.7%) of our overall tuberculosis cases. The foreign born **REMAIN THE HIGHEST RISK GROUP FOR TUBERCULOSIS IN MASSACHUSETTS.**

TUBERCULOSIS CASES BY PLACE OF BIRTH
MASSACHUSETTS 1984-1992

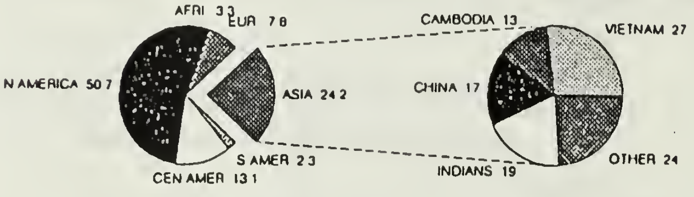


MDPH TB SURVEILLANCE PROGRAM

Haitians continue to represent the largest group (16% of the foreign born cases), followed by Vietnamese (13%), Indians (9%), Chinese (8%), Cambodians (6%), Dominican Republicans (5%), Cape Verdeans (4%) and Portuguese (4%). Although the number of Southeast Asian cases remained about the same in 1992, there has been over **a 10% increase in cases in Southeast Asians** overall since **1989**. The percent of cases from India more than doubled from the previous year. Cases from 35 other different countries were reported, each representing less than 2% of the overall tuberculosis cases for 1992.

When foreign born cases are analyzed by geographic region instead of just by country, half the cases are from North America; the remainder are primarily from Asia (24%), and Central America (13%).

MASSACHUSETTS TUBERCULOSIS CASES
BY GEOGRAPHICAL REGION *
1992



PERCENT OF
CASES

MDPH TB SURVEILLANCE PROGRAM

* 1 Unknown place of
birth

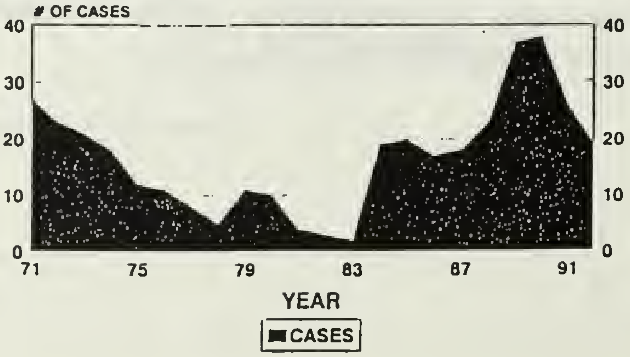
Case rates per 100,000 for the populations with the largest number of cases are: Vietnamese (182.2), Indians (96.4), Cambodians (92.5) and Chinese (31.6). Population data are unavailable for the number of Haitians and Cape Verdeans in Massachusetts, as some of these persons are undocumented.

4. CASES IN THE HOMELESS POPULATION:

Growing numbers of homeless, particularly in Boston, continue to pose tuberculosis control problems. It is estimated that there are more than 6,000 homeless in Boston and approximately 23,000 homeless statewide.

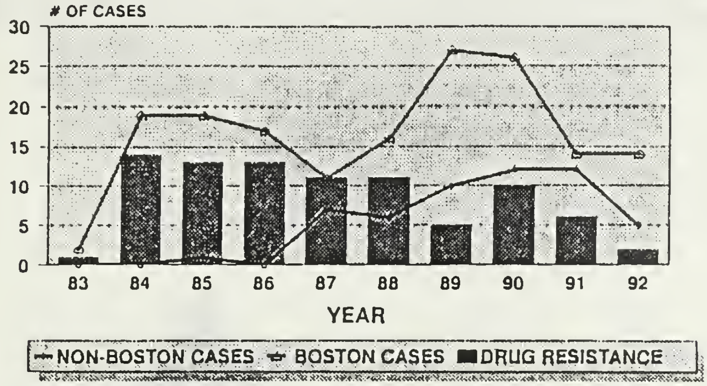
This year, 19 homeless cases (case rate approx. 82.6/ 100,000 population) were reported (**a 27% decrease from 1991 and a 50% decrease from 1990**). These results are significant and reflect a concerted effort by state, city and community groups to reach this high risk population.

TB CASES AMONG THE HOMELESS
MASSACHUSETTS,1971-1992



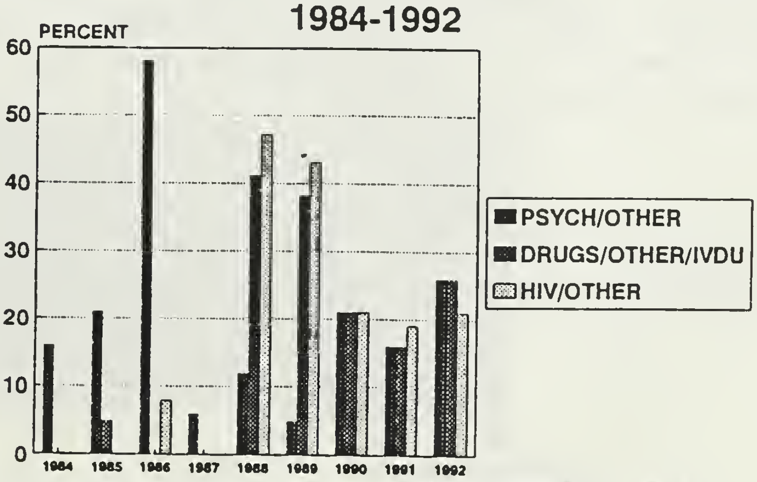
Seventy-four percent of these cases were in Boston and 26% were outside of Boston. For the homeless, the Isoniazid/Streptomycin (INH/SM) resistance pattern noted in the 1984-85 outbreak, decreased significantly - only one of the homeless drug resistant cases was INH/SM resistant in 1992.

TB CASES AMONG THE HOMELESS
MASSACHUSETTS, 1983 - 1992



Risk factor profile for the homeless cases is : 1) psychiatric disorders continue to increase (26% - **a 18 % increase over the last 5 years**); 2) 26% are reported as being injection drug users (IDUs); and 3) 21% have a known documented positive HIV status.

HOMELESS TUBERCULOSIS CASES BY RISK FACTORS*
1984-1992



MDPH TB SURVEILLANCE PROGRAM

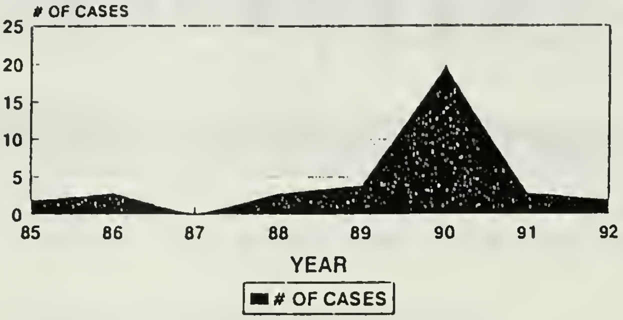
*1984-1989 only Boston shelter cases
not mutually exclusive

5. CASES IN INSTITUTIONS:

Persons in Correctional Facilities:

In 1990, an outbreak of tuberculosis with widespread transmission occurred at a prison located in the southeastern part of the State. This outbreak led to a massive screening effort (12,000 PRISONERS AND STAFF). Following this outbreak and the massive screening and educational program, routine screening fo inmates was instituted at all the State prison facilities. In 1990, there was a five fold increase in cases reported from correctional facilities in Massachusetts (n = 20), in 1992 only 0.5% of the cases were from the correctional system.

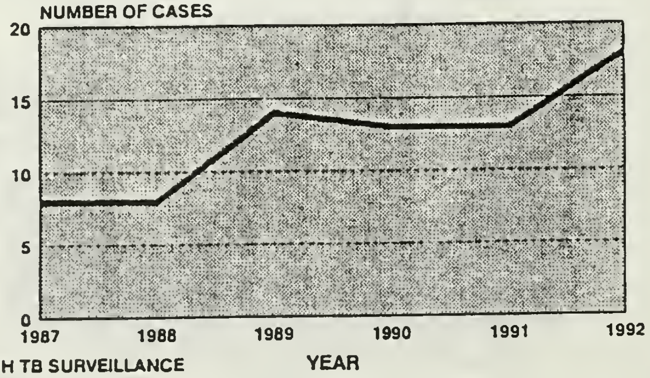
MASSACHUSETTS TUBERCULOSIS CASES
IN CORRECTIONAL FACILITIES
1985-1992



Persons in Long Term Care Facilities:

This year, there were 20 (4.7%) cases reported from long term care facilities (a **44% increase from 1991** and the second year with an increase). Most of these were in nursing homes (16) or other chronic care facilities (a chronic care hospital, a retirement home) and 2 cases were reported in nursing home employees.

TUBERCULOSIS CASES IN LONG TERM
CARE FACILITIES
MASSACHUSETTS 1987 - 1992



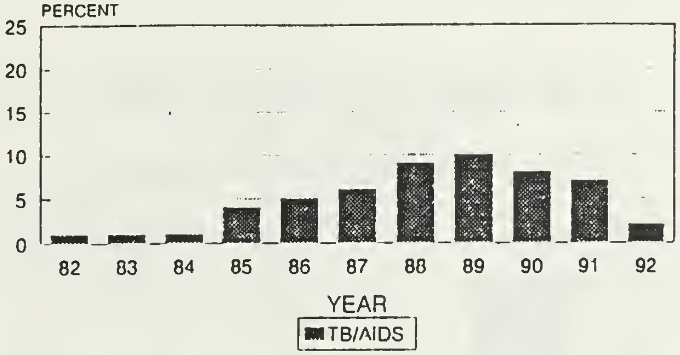
MDPH TB SURVEILLANCE
PROGRAM

6. TB/AIDS CASES: (Appendix 11)

Massachusetts has completed the matching of the Tuberculosis and AIDS Registries for the period of 1982 through December 1992. A total of 31 new TB/AIDS cases were added to this register in 1992 (259 matches to date).

When analyzed over time, it is noted that with each match the percent of TB cases with AIDS has risen per year (with a lag between the time of the TB diagnosis and the AIDS diagnosis) from 1% of the TB cases reported in 1982 to 10% in 1989. Since 1990 however, the trend has reversed. In 1990, 8% of the tuberculosis cases also had AIDS, in 1991, 7%, and in 1992 only 2% were reported.

PERCENT OF TB CASES DIAGNOSED
WITH AIDS (N = 256) *
1982-1992



MDPH TB /AIDS SURVEILLANCE PROGRAMS * YEAR OF TB UNKNOWN FOR 3 PTS

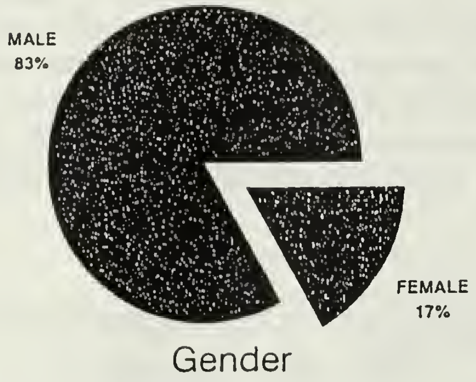
Demographic analysis of the TB/AIDS cases to date is as follows:

NOTE: When comparing the TB/AIDS cases to the AIDS cases, the TB/AIDS cases are excluded from the total AIDS cases. The match was done using the 1987 AIDS case definition. A retrospective review of TB cases is currently being done to identify HIV related cases that meet the new case definition.

Age and Sex:

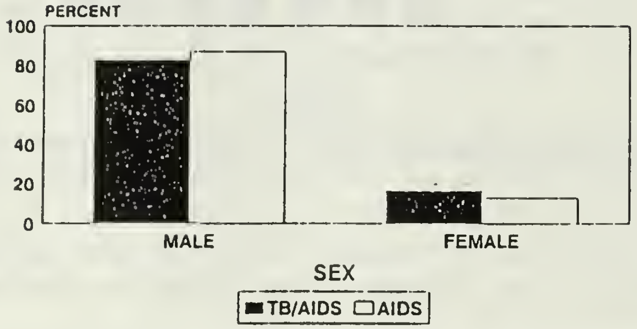
Mean age at diagnosis of AIDS for the TB/AIDS cases was 36 years. Eighty-three percent of the TB/AIDS cases were male and 17% were female - a 5% increase in females since 1990.

MASSACHUSETTS TB/AIDS CASES
BY GENDER , 1982-1992 (n= 259)



MDPH TB/AIDS SURVEILLANCE PROGRAMS

MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY GENDER
1982-1992 (TB/AIDS =259cases)



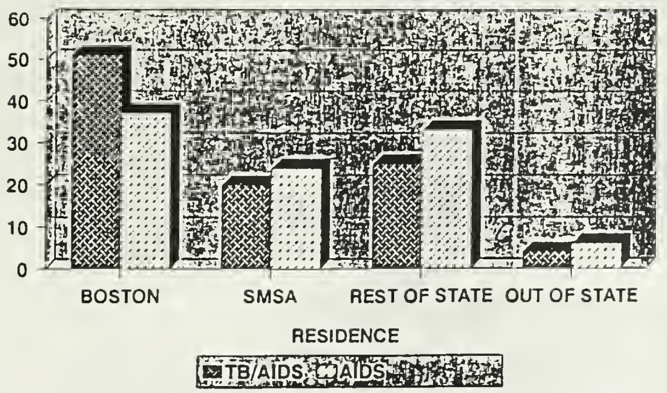
MDPH TB/AIDS SURVEILLANCE PROGRAMS

*AIDS cases exclude those diagnosed with TB

Residence:

Over half of the TB/AIDS cases (51%) and 38% of the AIDS cases resided in the City of Boston at the time of diagnosis. The SMSA accounts for an additional 20% and 25% respectively. When analyzed over time, there are increasing numbers of cases from outside of Boston.

MASSACHUSETTS TB/AIDS AND
AIDS* CASES BY RESIDENCE
1982-1992 (TB/AIDS=259 cases)

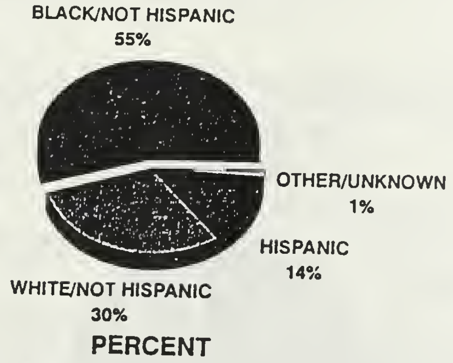


MDPH TB/AIDS SURVEILLANCE PROGRAMS *AIDS cases excludes those diagnosed with TB

Race/Ethnicity:

Persons of color accounted for 70% of the TB/AIDS cases.

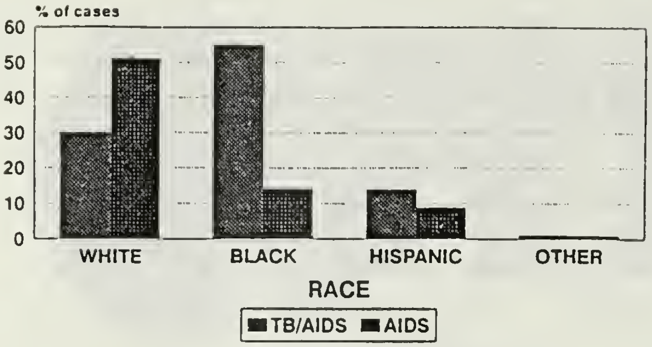
MASSACHUSETTS TB/AIDS
CASES BY RACE
1982-1992 (n=259)



MDPH TB/AIDS SURVEILLANCE PROGRAMS

When compared to the AIDS cases in Massachusetts, the proportion of TB/AIDS cases that were black/non-hispanic is considerably higher (55% vs. 19%).

MASSACHUSETTS TB/AIDS AND AIDS*
CASES BY RACE
1982-1992 (TB/AIDS=259 cases)

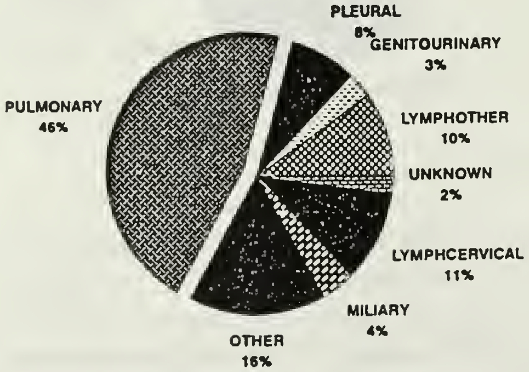


MDPH TB/AIDS SURVEILLANCE PROGRAMS *AIDS cases excludes those diagnosed with TB

Disease Site: (Appendix 12)

There are a total of 333 sites of TB disease for the 259 TB/AIDS cases. Forty-six percent of the TB/AIDS cases had a pulmonary site of disease (a 10% decrease from the last match), 21% had lymphatic, 8% had pleural, and 4% had miliary sites. The remainder of the extrapulmonary cases were in other sites, each representing less than 3% of the total TB/AIDS cases.

MASSACHUSETTS TB/AIDS CASES BY
TB DISEASE SITE*
1982 - 1992



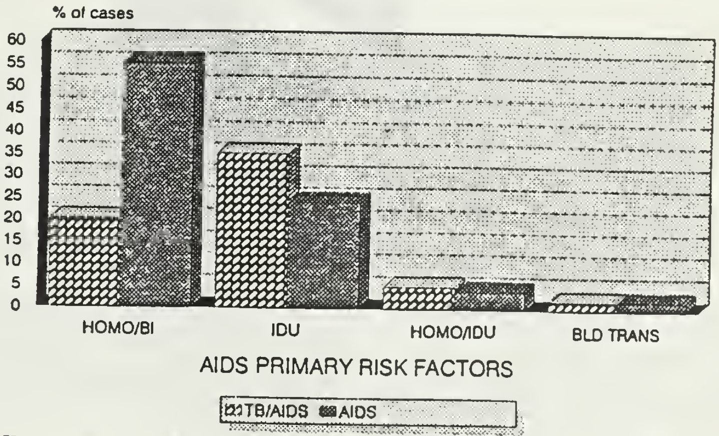
TB Disease Site

MDPH TB/AIDS SURVEILLANCE PROGRAMS *259 cases/333 sites of TB

Primary Risk Factors:

The homosexual/bisexual risk behavior category still accounts for the majority of the AIDS cases in Massachusetts (55%). In contrast, twenty percent of TB/AIDS cases occur in persons with this risk behavior. Thirty-one percent of the TB/AIDS cases are among the foreign born as compared to only 3% of the AIDS cases (Note, the "foreign born" category only includes those who have not been classified into one of the other risk categories, i.e. homosexual/bisexual, IDU, etc.) There is a growing number of TB/AIDS cases among injection drug users. Injection drug use now accounts for 35% of the TB/AIDS cases and 24% of the AIDS cases.

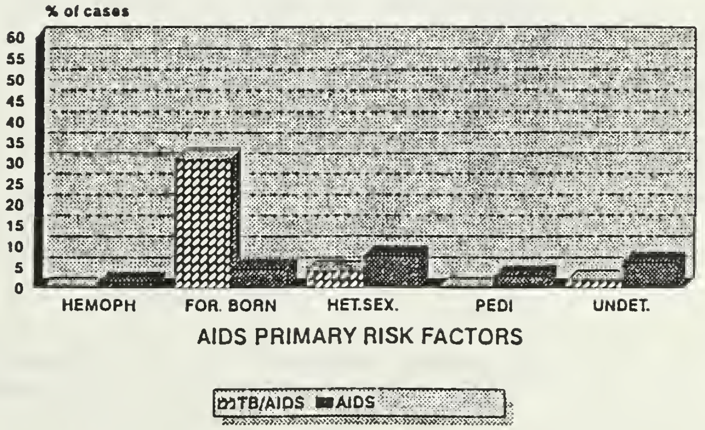
MASSACHUSETTS TB/AIDS AND AIDS* CASES BY
AIDS RISK BEHAVIORS 1982-1992(TB/AIDS=259 cases)



MDPH TB/AIDS SURVEILLANCE PROGRAMS

*AIDS cases exclude those diagnosed with TB

MASSACHUSETTS TB/AIDS AND AIDS* CASES BY
AIDS RISK BEHAVIORS
1982-1992 (TB/AIDS=259 cases)



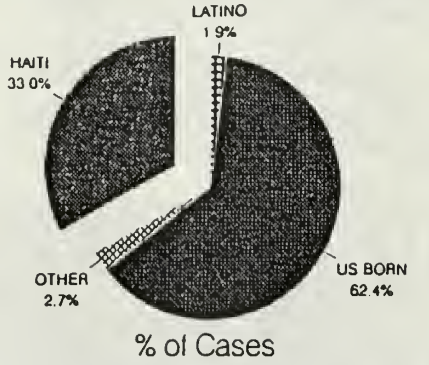
MDPH TB/AIDS SURVEILLANCE PROGRAMS

*Aids cases excludes those diagnoses with TB

Foreign Born:

When TB/AIDS cases who are foreign born are analyzed by place of birth, the **majority (88%) are Haitian.** Persons from South America and the Caribbean comprise almost half of the remaining cases in this category.

MASSACHUSETTS TB/AIDS CASES
BY PLACE OF BIRTH *
1982-1992 (n=258)

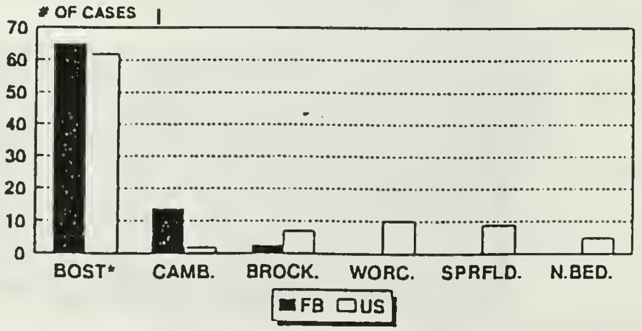


MDPH TB/AIDS SURVEILLANCE PROGRAMS

* 1 Unknown place of birth

When the TB/AIDS cases are further analyzed by place of birth and city of report, it can be noted that six cities account for 66% of the TB/AIDS cases and three cities account for 83% of the total foreign born cases in this category.

MASSACHUSETTS TB/AIDS CASES FOR CITIES
HAVING >5 CASES BY PLACE OF BIRTH*
1982-1992 (n=258)



MDPH TB/AIDS SURVEILLANCE PROGRAMS

*1 unknown place of birth

7. HIV INFECTION PREVALENCE IN SELECT SUB-GROUPS:

There are limited data available about HIV infection prevalence in Massachusetts. The Division of TB Control recommends that each case of TB be assessed for HIV infection risk and be offerred voluntary HIV counseling and testing. In 1992, 14% of the cases were known to have been tested for HIV; 67% of those tested were positive (9% of the 1992 cases).

Blinded Testing:

* Massachusetts has been participating in the CDC Family of HIV Serosurveys and blinded HIV testing has been done at three State Tuberculosis Clinic sites (Boston, Cambridge and Brockton) as part of this project. Results from Boston from 6/88 to 12/92 among Class III's and V's indicate a 22.7% **seropositivity rate** (126/556) - significantly higher than the cumulative national TB clinic average seroprevalence figures. Results from Cambridge and Brockton from 9/89 to 12/92, among Class III and V clients indicate a **seropositivity rate** of **5.5%** (3/55).

* In addition to the protocol funded by CDC to test only Class III's and V's, the Division has been able to independently analyze data from clients placed on preventive therapy at the Cambridge, Brockton and Boston TB clinics. Results from Boston from 6/88 to 12/92 among Class II patients prescribed preventive therapy, indicate a **3.4% seropositivity rate** (44/1292). Results from Cambridge and Brockton from 6/88 to 12/92 indicate a **1.5% seropositivity rate** (9/598) for the same set of Class II patients.

* In 1992, a study was conducted at three state correctional facilities. A total of 2,196 inmates had samples submitted for HIV testing from January to June of that year. Of those, 177 or **8.1 percent were HIV positive.** The rate of infection was almost twice as high in female inmates (13.1%), than in males, and the rates were highest in injection drug users (21.1%).

HIV Seroprevalence in TB Clinics in Selected Metropolitian Areas

Location	No. Clinics	Percent
All Areas	20	3.4
New York City	1	46.3
Newark	1	33.6
Boston	1	26.6
Miami	1	23.5
Seattle	1	5.2
Los Angeles	4	4
San Francisco	1	1.4

CDC-Family of Seroprevalence Surveys

PART II

1992 TB DIVISION ACTIVITIES

I. GENERAL ADMINISTRATIVE ACTIVITIES:

A. REGULATIONS:

* Submitted a revised version of the TB component of the Isolation and Quarantine regulations which addressed the uncertainty of duration of therapy and level of infectivity of pulmonary TB cases. The Regulations have been promulgated.

B. GRANTS:

* Submitted and were subsequently awarded the FY93 Cooperative Agreement funds

* Submitted and were subsequently awarded MDR-TB Supplemental Cooperative Areement funds

* Coordinated the receipt of additional general supplemental Cooperative Agreement funding

C. COMMITTEES:

* Sue Etkind participated on the ALA Lung Disease Guidance Committee

* Division staff participated in the DPH Prevention Work Group

* Division staff attended the AIDS Managers meetings

* Monthly collaborative meetings were continued with the Boston TB Program

D. MANAGEMENT TRAINING:

* Linda Singleton attended a Budget Management Workshop

* Sue Etkind attended Total Quality Management training

* Janice Boutotte attended the Tier III Management Training Progam

* Division staff participated in a Contracts/Purchase of Service Workshop

E. OTHER:

* Linda Singleton participated in the hearings for the DON Linkage Program

* Hosted the Directors of the Puerto Rico and Rhode Island Divisions of TB Control

* Relocated the regional offices as follows: TSA 2 and 3 from Middlesex County Hospital to Tewksbury Hospital and TSA 1 from UMass, Amherst to the Springfield Health Department and participated in plans to move the TSA 5 office to another facility

II. TB ELIMINATION PROMOTIONAL ACTIVITIES:

A. NATIONAL LEVEL:

* Sue Etkind testified on the "Resource Gap" at the National Coalition for the Elimination of Tuberculosis meeting in Washington, D.C.

* The Division responded to several requests for information from Senator Kennedy's Office

* Dr. Nardell served as a consultant for The national Office for Treatment Improvement on UV light and environmental concerns at substance abuse treatment sites

* Janice Boutotte was selected as the American Nurses' Association representative to the National Coalition for the Elimination of Tuberculosis. She is a member of the Steering Coordinating Committee of this group and is co- chair of the Professional Education group. Janice also presented oral and written testimony re the ANA's activities for TB control at the ANA national convention

* Sue Etkind testified at the National Health Policy Forum on the "State Perspective on TB Control", in Washington, D.C.

* Sue Etkind served as a consultant to the U.S. Congress Office of Technology Assessment (OTA).

* Sue Etkind continued her term as a member of the national Advisory Committee for the Elimination of Tuberculosis.

* Sue Etkind attended the national CDC sponsored "TB Controllers Meeting" in Atlanta and participated as a consultant for the preparation of the CDC FY93 TB Cooperative Agreement application

* Sue Etkind served as a reviewer for CDC's Office of Minority Health RFP entitled "TB/STD/HIV Activities at Selected CBO's"

B. LOCAL LEVEL:

* Continued to collaborate with and assist, the Massachusetts Commission for the Elimination of Tuberculosis. Activities of this group included: a tour of the Shattuck Hospital Tuberculosis Treatment Unit, a tour of the Boston City Hospital TB Clinic, and several Executive Sessions. The Commission prepared it's Report and public hearings for comment were held in Springfield and Boston. The Report with 31 recommendations was officially released during the 2 day "Ted Badger" TB meeting in December, accompanied by a press breakfast. An on-going Massachusetts Committee for the Elimination of Tuberculosis will be convened in 1993. (Commission member list- Appendix 13)

III. EPIDEMIOLOGY, DATA MANAGEMENT

A. DATA MANAGEMENT

In 1992 the Division reorganized its Surveillance Unit structure to adapt to increasing resources and to improve its ability to evaluate the effectiveness of the Division's assessment, prevention, and control measures. The Surveillance Unit is responsible for the coordination of all the data-related activities of the Division, including nursing and outreach worker case management, assessment, and prevention services. In December the Unit was physically relocated in a new self-contained unit within the building. The Surveillance Unit has been organizationally subdivided into two smaller integrated sections to better track the activities of the various projects: 1) the Case Registry; and 2) The Prevention Registry.

The Division has continued with plans for an enhanced data management system. A computer has been installed in each of the four regional offices, equipped with a modem to access the main database on the network at our Central Office.

Computer Services has completed the input screens for the clinic interagency forms. In addition, new clinic forms have been developed and are currently in use in our clinics, however, evaluation has revealed several changes that need to be made. The new forms include information on clients' risk factors for TB, HIV assessment information, contact information and supervision of therapy. Input screens have also been developed for health department TB reports, the TSA nurses' Case Management Worksheets, and patient follow-up screens. Electronic linkages have been completed to allow the Division to electronically transmit the new Report of Verified Case of Tuberculosis forms to CDC beginning in 1993. This system is expected to be implemented by the end of April 1993 until the new software is available. Input screens have recently been developed for the Contact Registry to document the contacts to each active case and record their screening results and course of preventive therapy. These screen have just received final in-house testing and regional staff will be trained in their use this spring.

Two trainings for regional nursing staff on use of the new computer system have been held and nurses are beginning to utilize the new system. TB Surveillance Unit staff have been trained on various aspects of the system, specific to their individual jobs and responsibilities. Over the next few months they will all be cross-trained on the entire system. The staff are actively involved in assisting in trouble-shooting the new system and identifying needed reports for computer services to develop.

B. PREVENTIVE REGISTRY

Massachusetts currently has a statewide TB clinic system providing free evaluation and treatment to all persons. Each visit to any of the clinics is documented by the clinic on a clinic record, the interagency form. Every one of these forms is sent to the regional TSA office and the TSA nurse reviews each record for appropriateness of treatment, possible new suspect cases, and compliance with therapy. With the implementation of this new system, the Case Register Surveyors in the regional offices will input the data from these forms on persons with no evidence of clinical disease into the database and continue to update the database after each clinic visit.

The Prevention Registry Manager will be able to immediately access this information via the network and be able to track the number of persons being screened, evaluated, and placed on preventive therapy. Exception reports will be developed to identify immediately persons who are noncompliant. The Surveillance Manager will refer these persons back to the regional office Case Register Surveyors who will take appropriate action to retrieve the missing data.

Once the Prevention Registry is fully operational, the Prevention Manager will begin to expand the system beyond our clinics. The system will be limited in scope, and will begin by building on current and past Division screening activities with other facilities such as the State Correctional System, long term care facilities in cooperation with Health Care Quality, and initiate new linkages with facilities which serve HIV positive persons, such as hospices.

C. REPORTING:

The 800 line for the 24 hour reporting system has been installed and the number is being disseminated. The new reporting number is **1-800-446-5528.**

D. OUTBREAK CONTROL:

* With the Epidemiology Division, investigated an outbreak of TB in research monkeys

* With the Refugee Health Program and the Boston TB Program, participated in the screening and followup of a special group of Haitian immigrants relocated from Guantanamo Bay.

E. OTHER ACTIVITIES:

* Completed the TB/AIDS Registry match for the period of 1982-1992

* Wrote an external data request policy

* Completed and analyzed the 1992 TB morbidity data; prepared related charts, graphs and slides

* Linked the Regional Offices with the Central Office computer network

* Welcomed case registry surveyors to the field offices

* Responded to a request for Health Status Indicator data in preparation for the DPH RF process

* Began computer skills training for the TSA Nurses and clerical staff

IV. CASE MANAGEMENT: OUTREACH PROGRAM/DIRECTLY OBSERVED THERAPY

In 1990 the focus of the ORW Program shifted the types of assignments made to the ORWs to include more persons on supervised and Directly Observed Therapy, Class III and Class V patients and close contacts. Assignments were made based on a priority followup system: **I. Active Cases**: history of noncompliance, IDUs, transients, children, alcoholics, cultural/linguistic minorities, inpatients of Lemuel Shattuck Hospital Tuberculosis Treatment Unit, drug resistance and prior history of treatment/disease; and **II. Persons on Preventive Therapy**(if case loads allow followup of preventives): history of noncompliance, known or suspected HIV infection, contacts, children, persons with abnormal chest x-rays, converters, IDUs and cultural/linguistic minorities.

In 1991, the Division of Tuberculosis Control decided to modify its way of delivering outreach services to active TB cases. In an attempt to ensure that all active cases completed a course of therapy, the following policy was adopted and implemented in the spring of 1991: all new suspect cases of tuberculosis in designated "high risk" areas, and based on priority followup system, were assigned an outreach worker (if/where available) by the TSA nurse covering that area.

The use of outreach workers (ORWs) for case management, Directly Observed Therapy (DOT), contact followup, etc. has proven to be an effective strategy for tuberculosis control in Massachusetts. Thirty-seven percent of the 1992 cases were assigned to ORWs; 37% were the responsibility of local health departments, and 26% were followed by others.

PROVIDER ACCOUNTABILITY/MANAGEMENT
TUBERCULOSIS CASES
Massachusetts 1992 (n=417•)

Provider Responsible	#Cases(%)	# on DOT(%)	% of Total Cases on DOT
Outreach Worker	121 (29)	36 (43)	8.6
Refugee Hlth.Program	35 (8)	6 (7)	1.4
Local Health Dept.	153 (37)	19 (22)	4.5
Visiting Nurse's	12 (3)	5 (6)	1.2
Private Provider	14 (3)	1 (1)	0.2
Other	41 (10)	18 (21)	4.3
Unknown	41 (10)	0 (0)	0
Total	417(100)	85(100)	20.2

• excludes 11 patients diagnosed at death

In 1990, approximately 25% of cases outside the city of Boston were followed by private providers. In 1992, 14 (3%) were followed by private providers. The TSA nurses request written clinical updates from private providers on a quarterly basis. When indicated, the TSA nurses offer ORW services to private providers for at-risk clients pending ORW availability. New clinical update forms have been developed for the new computer system which will can be used by both clinic and private providers and should increase the amount and type of information received to help assist the nurses in assigning ORWs to patients managed on a private basis.

In the past, outreach workers worked under the Public Health Nursing Advisors in the field with central office coordination being done by the Director of Epidemiology, Case Management and Prevention Services. To be really effective, however, much closer monitoring of the ORWs activities was needed in order to not only assure that all eligible cases are assigned; but also that those not assigned have another health care provider identified as the person responsible for followup; to compare treatment outcomes between groups; to ensure that all assigned cases eligible for DOT receive it; to improve timely contact investigation; and to ensure that contacts, especially children are screened, evaluated, placed on therapy and complete therapy when appropriate. The hiring of an Outreach Program Coordinator will facilitate this process. The Project Coordinator will oversee the Outreach Program, monitor the ORW activities and collect data to better document ORW accountability and effectiveness, as well as the program outcomes.

In 1992, under the Cooperative Agreement, the Division of Tuberculosis Control had 5 full time "02" and 6 part time (blanket contract "03") ORW positions assigned to work in high risk communities across the State. These high risk communities are the areas with the greatest need for follow-up, based on TB case rates, the numbers of patients on therapy, types of at-risk populations, cultural/linguistic minorities, compliance rates of persons in these areas, and the need for assistance by the local health departments. Recruitment of ORWs is usually targeted towards specific high risk populations, such as the homeless or cultural/linguistic minorities. Both the geographical areas and special populations served are frequently re-evaluated and ORWs reassigned as needed to address new problem areas.

The number and percent of cases placed on DOT and followed by the ORWs has remained fairly stable over the years. In 1992 the Division emphasized the use of DOT, particularly by ORWs, with the result that the number of cases on DOT followed by ORWs doubled. (Data is not available prior to 1991 for cases on DOT delivered by non-outreach staff.) The data in the table for the number of persons followed on DOT for 1987 - 1990 is prevalence data and for the other years incidence data. Since ORWs are assigned primarily to specific "high risk" communities, percents of the total number of cases in those cities are also compared.

TUBERCULOSIS CASES TREATED WITH DIRECTLY OBSERVED THERAPY BY OUTREACH WORKERS

OUTREACH WORKERS, MASSACHUSETTS 1984- 1992

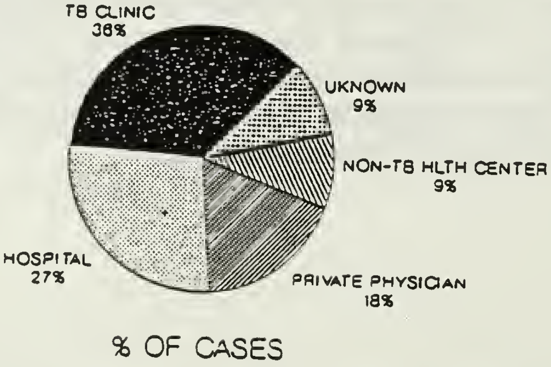
	#Cases on DOT	%/Total Case	% of Project Cities••
1984	N/A	-	-
1985	35	7.7	12.3
1986	N/A	-	-
1987	32	8.1	11.8
1988•	49	12.8	19.3
1989	29	6.9	9.7
1990•	29	6.6	9.7
1991	26	5.9	9.1
1992••	71	17.0	25.4

•lost 1 full time state funded ORW
••excludes 2 new cities added for 1992

In terms of followup for those cases with MDR TB:

* thirty six percent were diagnosed at a TB clinic, while 27% were diagnosed at hospitals. Eighteen percent were diagnosed by a private physician and 9% had no information on the source of diagnosis.

MASSACHUSETTS MDR-TB CASES
BY ORIGIN OF REFERRAL
1992 (n=11)



(The following follow-up data is based on 10 MDR-TB cases (one case was culture positive after death)

* Local Board of Health nurses were responsible for the majority of case follow up (90%).

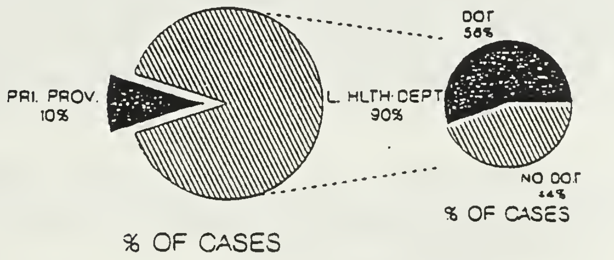
Follow up with an Outreach Worker (ORW):

ORWs were involved in 33% of the cases that local Boards of Health followed up.

Follow up with Directly Observed Therapy (DOT):

Over half (56%) of the MDR-TB cases followed by the local Board of Health were at one time put on DOT. Data regarding the length of time a case was on DOT was incomplete. Efforts will be made to include this in next year's report.

MASSACHUSETTS MDR-TB CASES
BY CASE MANAGEMENT
1992 (n=10)*



*Excludes one case culture positive after death

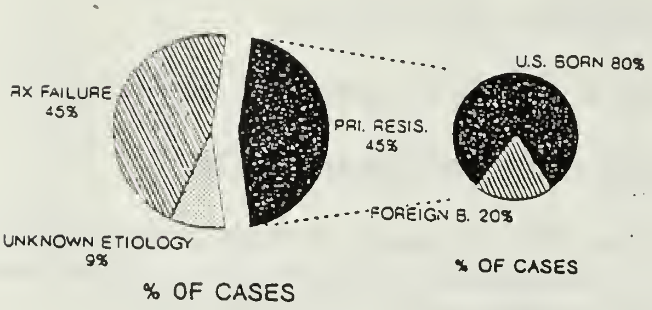
History of non-adherence*:

Forty five percent of the cases had documented previous non-adherence. An additional 45% were documented to be adherent. Ten percent could not be confirmed either way.

Etiology of Resistance:

Treatment failure was documented in 45% of the MDR-TB cases. Another 45% of the cases showed MDR TB upon initial culture making primary resistance a likely cause. Nine percent had an unknown cause. Eighty percent of the cases suspected to be primary resistance, were U.S. born. Twenty percent were foreign-born.

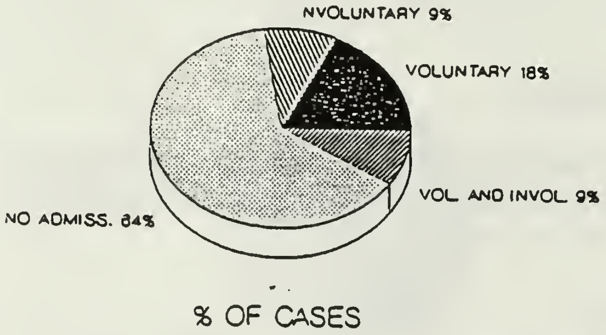
MASSACHUSETTS MDR-TB CASES
BY ETIOLOGY OF DRUG RESISTANCE
1992 (n=11)



Admission to a long-term care TB unit:

Thirty six percent of the MDR TB cases were admitted to the State's long-term care TB unit at Lemuel Shattuck Hospital. Nine percent were admitted on a voluntary basis. Eighteen percent were mandated by a court order (involuntary). An additional nine percent were admitted under both circumstances (involuntary initially and volunteered to stay).

MASSACHUSETTS MDR-TB CASES
BY ADMISSION TO TB UNIT
1992 (N=11)



V. PREVENTION PROJECTS

A. PRISON PREVENTION PROJECT

GOAL: To coordinate all TB screening, containment and prevention activities in correctional facilities in the State.

The purpose of this Project is to coordinate all TB/HIV related activities in the state and county correctional systems in Massachusetts. This will include assessment of current TB screening and prevention activities at all correctional sites, assessing current TB/HIV data management needs, providing needed TB/HIV education, and developing a proposal for continued funding of an HIV-Related TB Prevention Project (as appropriate) at these sites for the next grant cycle. Federal funding was granted in August and the position was posted on 10/13/92. Interviews of potential applicants were conducted. Hiring was delayed however, due to lack of qualified candidates and pending negotiation of the 1993 grant. In addition to the Prevention Project activities, Division staff worked with EMSA (the Department of Corrections health care contractor) regarding the TB database surveillance system being used in the state correctional facilities.

B. ABCD (Action for Boston Community Development)TB/STD/HIV PREVENTION PROJECT

GOAL:To deliver tuberculosis education, screening and preventive therapy services to injection drug users and other high risk minorities in 7 inner city Boston housing developments, by targeting those at risk where they live, work and socialize.

ABCD Philosophy: ABCD's experience in helping individuals in the housing projects to understand their health risks, and to eventually change their health beliefs and behavior, is that the process is gradual, continuous, and dynamic. This process can only be achieved by developing a trusting partnership with the community, continuously providing education about tuberculosis, seeking the involvement of community leaders, and helping the community assume responsibility for tuberculosis control.

Funding for ABCD was awarded in June 1992 and the contract was awarded in July 1992. This report reflects the progress made August 1992 through December 1992.

The ABCD personnel were educated about tuberculosis through scheduled conferences for large groups and small training sessions. Outreach/peer educators had a "train the trainer" session to help them design appropriate educational programs and materials for their outreach efforts.

ABCD utilizes several different methodologies to facilitate client movement through each of the described stages. The outreach/peer educators organize large groups in order to introduce the facts about tuberculosis to the community and then move onto smaller groups where more details are presented. Other methodologies include: health fairs where large numbers are invited to attend; surface outreach into specific housing projects where concepts about tuberculosis are introduced; support groups for small numbers who need more individualized teaching; presentations/educational discussions for specific groups such as grandparents and youth groups; and training sessions for community peer educators.

During the Project report period, approximately 1000 persons attended 7 health fairs located in 5 different housing projects. These travelling health fairs were done in collaboration with the Boston Housing Authority, the Boston Dept of

Health and Hospitals, health service providers, such as Children's Hospital and community health centers, serving the individual communities. Five hundred and fifty pieces of literature about TB and the TB/HIV connection were distributed to interested persons. Health fairs which cannot be held in the cold weather months, were limited to dates in August through October.

Surface outreach targeted smaller groups within the housing projects for introductory education about tuberculosis.

Presentations and educational discussions were held in the housing projects in places such as the rental office, individual apartments, and community rooms.

Support groups for individuals with special problems or concerns, are a means for the outreach/peer educator to help dispel fears regarding tuberculosis.

Trainings to community peer educators were held on four different dates. Community peer educators are utilized to do further TB education with their peers and are granted a small stipend for each educational activity.

In 1992, the TB Prevention and Education Program has not advanced to the stage of tuberculosis screening, however, some initial steps have been taken to make skin testing accessible as well as timely in relation to referrals. A memorandum of understanding (to do skin testing) has been made with one community health center and plans are underway to make similar agreements with other health centers. In addition, Boston Department of Health and Hospitals (BDHH) has agreed to accept referrals, for persons who need chest X-rays and medical evaluations, in a time-efficient manner. Although the waiting list for appointments has been extended recently (secondary to increased demand), every effort will be made to prioritize appointments according to risk factors.

Plans are also in progress to teach the outreach/peer educators how to read PPD mantoux skin tests. The tests can then be read in mutually agreed upon places and thus avoid "no show" clinic visits as well as missed opportunities for timely assessments.

Finally, all community and individual education about tuberculosis (as discussed in the report for objective 1) includes the need to be skin tested and, if necessary, be referred for a medical evaluation and a chest X-ray.

C. ENVIRONMENTAL CONTROLS

GOAL: To define the relationship between environmental factors and tuberculosis transmission in health care facilities.

Objectives of this Project include:

* to assess the environmental risks for TB transmission in institutional settings in Massachusetts, including TB clinics, hospitals, shelters, nursing homes, prisons, and other acute and chronic facilities.

* to educate institutional staff on current environmental precautions against TB transmission.

* to assist institutions in making their environments safer places to work or reside.

* to provide limited technical expertise on environmental TB control issues such as:

a. administrative planning (building layout, shelter size, isolation procedures, etc.)
b. building ventilation (direction of airflow, outdoor air mix, air recirculation, etc.)
c. ultraviolet germicidal irradiation (UVGI)
  - general information on UVGI
  - measurements of UV irradiation for both safety and efficacy
d. personal protection devices (i.e., personal respirators)

Difficulties in identifying an appropriate, interested doctoral candidate have delayed the implementation of this Project. Dr. Nardell has continued to work with the Harvard School of Public Health and it is anticipated that a candidate will be selected during 1993.

D. HIV-RELATED TB PREVENTION PROJECTS:

1. HIV COUNSELING AND TESTING - Boston

GOAL: To provide HIV counseling and testing, either on site or by referral, to at least 90% of persons with TB infection or disease attending the Boston City Hospital TB Clinic.

Due to the lateness of the funding award from the unobligated pool, only one of the 2 designated positions had been filled by the end 1992.

2. METHADONE MAINTENANCE PROJECTS - Boston, New Bedford/Wareham, Holyoke/Springfield

GOAL: To determine the acceptability, safety and effectiveness of delivering TB services to persons enrolled in methadone treatment services.

Since the HIV-related TB prevention projects in methadone sites were funded in July 1990, the selected sites have been responsive to the requirements of the program and have instituted policies and procedures to facilitate the smooth functioning between health departments, TB clinics, and methadone maintenance centers.

The program coordinators/directors for the TB/HIV prevention projects are responsible for insuring the utilization of the CDC guidelines for screening, treatment, and follow up. They serve as liaisons between clients, health departments, and TB clinics, and are responsible for appropriate referrals when clients leave the program.

The required on site Mantoux testing is accompanied by pre and post test counselling surrounding the need for medical evaluation and possible preventive therapy. In addition, all methadone sites offer HIV testing which includes pre and post test counselling as well. All counselling is language specific and culturally sensitive.

3. THE SEXUALLY TRANSMITTED DISEASE CLINIC PROJECTS: Lynn, Springfield, New Bedford

GOAL: To determine the acceptability, safety and effectiveness of delivering tuberculosis services to persons attending STD clinics.

All necessary personnel (three outreach workers and one nurse coordinator) have been hired and are in the final stages of their training and orientation period. The nurse coordinator who was hired, Mrs. Patricia Gedarovich RN, MPH, has extensive community outreach experience.

The outreach workers have been performing routine PPD tests, under the direction of the assigned STD nurse, so that they may soon function independently. One of the outreach workers has completed the TB training module, and is presently doing PPD testing and reading on his own. He is also following up on those clients that may have tested positive and he is making sure that they are referred to the appropriate facility for medical evaluation.

The following is a list of 1992 ORW activities/trainings for this Project:

* TB training module as described previously in the original proposal.

* Introduction to STD clinic staff, area TB nursing staff and nursing support personnel, and local TB clinic or hospital personnel.

* Familiarity with STD clinic flow, policies, procedures, and how they are incorporated into the daily functioning of the clinics.

* TB/STD computer training on data collection and data transmission.

* The outreach workers have been given their own laptop computers for field work.

* The outreach workers and their associated clinics have been given the necessary testing supplies such as; PPD solution, syringes, and sharps containers.

* Transportation of patients for medical evaluation has been approved at the state level and the outreach workers are aware of this.

* An extensive training in community outreach, so that they are well informed on what is and is not appropriate conduct while dealing with clients at the community level. Safety issues and eliciting client trust were also topics that were reviewed for the outreach workers.

* The outreach workers are able to recognize the signs and symptoms of Tuberculosis.

* The outreach workers have been informed about special circumstances when the two-step test PPD test method is required, and when HIV positive clients are given other types of skin tests to test for anergy.

* The ORW's were instructed on the importance of directly observed therapy (DOT) and what their role would be in that regard.

* It was agreed that monthly monitoring of signs and symptoms associated with TB medication administration would be done by the area TB nurses and/or the nurse coordinator in conjunction with the outreach worker.

* The outreach workers are aware that due to language barriers they were chosen to be the client's advocate at the clinic, and where necessary in the community also.

* The outreach workers are encouraged to develop culturally sensitive TB educational materials for the clinic populations.

* The outreach workers all have log books so that clients who are tested can be logged, as well as clients who refuse testing. This way we may have more complete information on the actual numbers of individuals approached for testing.

* The ORW's have attended several TB conferences in order to meet area personnel, learn about TB morbidity and pathogenesis, and stress the importance of the project goals and objectives.

As the nurse coordinator began at the end of this Project period, progress on the objectives will be described in the next report.

E. OTHER SCREENING AND PREVENTION ACTIVITIES:

* Received a copy of the TB/HIV Risk Assessment Study results and met with John Auerbach of the AIDS Bureau, to discuss the recommendations

* Began the Class II blinded HIV seroprevalence study at the Brockton TB Clinic

* A post-graduate nursing student from Northeastern completed a TB/AIDS Project

* A MD/MPH student from Tufts completed a Preventability Study of 1991 cases from TSAs 3 and 5

* Met with Anne Sheets, Director of the Division of School Health and her staff to discuss targeting school children for TB prevention and control activities and submitted an article for the School Health newsletter

* In conjunction with the Division of Health Care Quality, completed a mailing of TB recommendations and educational materials to more than 700 long term care facilities across the state

* Collaborated with the Massachusetts Shelter Providers Association on an educational mailing and conducted regional TB inservices for providers of services to the homeless

* Collaborated with the Massachusetts County Sheriff's Association Training and Education Department in conducting TB regional inservices for county facility staff.

* Ed Nardell and Sue Etkind met with the engineers from the Office of Planning and Evaluation of the Division of Health Care Quality to discuss the implementation of the environmental component of the CDC TB/HIV recommendations for health care facilities

VI. CLINICAL SERVICES:

The Division provides TB clinical services through a system of TB clinics (Appendix 14) and an inpatient unit at Lemuel Shattuck Hospital. The following is a summary of staff activities and support services provided during 1992 in these areas:

A. OUTPATIENT SERVICES:

* Addressed TB drug shortages (INH, Streptomycin, Cycloserine and PAS)

* Addressed PPD shortage problems

* Completed the Compliance Study

* Addressed clinic isues at: Lowell, Lawrence, Cape Cod, Brockton, and Worcester City

* Wrote the TB component of the DPH RFP for services and participated in the review process for the three selected pilot sites

* With the assistance of T. Rheaume, completed the first draft of the TB Clinic Manual

* Continued to work with the Chelsea Health Center on the formation of a TB satellite clinic at that facility

B. INPATIENT SERVICES:

* Cooperated with the staff of the Tuberculosis Treatment Unit (TTU) at Shattuck Hospital, to put on a descriptive meeting for representatives of the New York City Mayor's Office, the New York City Health Department and the state of New York

* Responded to inquiries from Florida, California, the AIDS Action Council in

Washington, D.C, and the CDC Office of General Counsel re the provision of TB long term care at Shattuck

* Processed legal, involuntary hospitalization papers on 7 noncompliant patients

* Worked with the DPH legal dept, the Boston TB program and staff from the Tuberculosis Treatment Unit on fiscal and regulatory issues

* Drafted new admission forms for use on the TTU

VII. TRAINING AND EDUCATION:

A. TSA NURSES

The following tables summarize the 1992 educational inservices given by the TSA nurses:

1992 Educational Inservice of TSA Nurses by TSA

N = 83

TSA	# of Inservices
01	21
02	27
03	12
05	23

1992 Educational Inservices of TSA Nurses

by Number of Participants

# of Participants	# of Inservices	Percentage
02 - 25	38	46
26 - 50	20	25
51 - 100	12	13
> 100	03	04
Unknown	10	12
TOTALS	83	100

1992 Educational Activities by TSA Nurses

N = 83

Location	# of Inservices
Nursing Home	31
Government Agency	13
Hospital	9
Home Care Agency	6
Within a Larger Conference	5
University or College	4
Social Service Agency	3
Other	9

1992 Educational Activities of TSA Nurses
by Curriculum

N = 83

TB Update	48
Mantoux Training	14
Both	19
Other	2

B. OTHER GENERAL TRAINING/LECTURES:

* Janice Boutotte lectured on TB and the TB/HIV Connection to the AIDS Bureau staff

* Division staff participated with other Bureau Divisions and the Division of Substance Abuse, in the central and regional Substance Abuse Service Provider workshops on Communicable Diseases

* Dr. DeMaria presented TB information to the Health and Public Safety Committee of the Springfield City Council

* Sue Etkind and Janice Boutotte presented a TB Update to representatives of 55 VNA's and respiratory therapists across the state

* Sue Etkind moderated a workshop on "TB and Homelessness" at the National TB Mobilization Workshop at CDC

* Janice Boutotte gave 2 inservices to the staff of the Plymouth County House of Correction

* Division staff participated with other Bureau staff, in the WIC regional Immunization Training Database Initiative

* Dr. DeMaria presented TB information to the Kaplan Society (a Suburban Infectious Disease Group)

* Dr. Nardell was an invited speaker for the Indiana annual tuberculosis seminar

* Dr. DeMaria presented information on TB/HIV at a Massachusetts Hospital Association sponsored meeting on the OSHA regulations

* Janice Boutotte presented an inservice to the college health nurses meeting at Greenfield Community College

* Janice Boutotte presented TB information to the Hearings Officers of the Department of Public Welfare

* Division staff gave an inservice to the members of the Sexually Transmitted Disease Division

* Division staff participated with the American Lung Association of Massachusetts/Massachusetts Thoracic Society in the planning and conducting of the expanded 2 day "Ted"Badger TB conference held in December, entitled " The New Tuberculosis: Medical, Scientific, Epidemiologic and Public Health Issues"

* In conjunction with the Refugee Health Program and the Boston Department of Health and Hospitals TB Program, the Division conducted a PPD training for outreach workers

* Dr. Nardell and Sue Etkind attended the World Congress on Tuberculosis in Washington, D.C.

* Dr. Nardell and Sue Etkind lectured at the Harvard School of Public Health to students from the School of Tropical Hygiene

* Carol Cahill attended the CDC "TB Today" course in Atlanta

* Drs' Nardell and DeMaria, Linda Singleton, Janice Boutotte and Jo-Ann Keegan attended an TB/AIDS seminar in New York City

* Janice Boutotte provided in-services at the Mass Health Officers Regional Meetings in Wilmington and Boston

* Dr. Nardell lectured for the Infection Control Society of America's regional meeting "TB-the Next Epidemic: Meeting the Infection Control Challenge"

* Dr. Nardell and Sue Etkind participated in the New England Laboratory Training Network seminar on TB laboratory methods for laboratorians

* Dr. Nardell and Sue Etkind participated in the New Hampshire TB symposium

* Sue Etkind was an invited speaker at the Northeast Regional Epidemiology meeting

* Janice Boutotte assisted with the TB portion of a training program for Boston College nursing students

* Regional TB staff meetings were conducted in all TSA's. These meetings were open to all clinic staff and included updates on TB and TB Division activities

* Janice Boutotte chaired an American Nurses Assoc. Committee charged with developing a TB curriculum and reviewed the ANA pamphlet "TB in the Workplace"

* Sue Etkind was an invited speaker at a TB symposium sponsored by the Boston TB Program

* Sue Etkind was an invited speaker at the Mass Health Officers Annual Meeting in Falmouth

* Dr. DeMaria gave a TB presentation to the Mass Trials Court staff

* Janice Boutotte reviewed the ANA statement on Nursing Care of HIV Patients

c. MEDIA/PUBLIC RELATIONS:

* TB articles were published in numerous papers such as the West, Northwest, South and North weekly sections of the Boston Globe, the Lowell Sun Chronicle, the Brockton Enterprise,the Springfield Union News, the Holyoke Transcript Telegram, and the Lawrence Eagle Tribune

* TB spots were televised on Channels 4, 38

D. ABSTRACTS/PAPERS PRESENTED:

* American Thoracic Society/ALA Annual Meeting, 1992:

"Tuberculosis Nurse Elimination: Implications for Future TB Control in the United States" (S. Etkind, et al)

"PPD Positivity Among Soviet Refugees: TB Infection or BCG Effect?" (J.Cochran, et al)

"Implementation and Results of TB Surveillance in a State Correctional System" (J. Boutotte, et al)

"The Massachusetts Blue Ribbon Commission for the Elimination of Tuberculosis" (S. Etkind, et al)

"Fans, Filters and Rays: Assessing the New Air Disinfecting Devices" (E.Nardell, et al)

"The Expanded Role of Outreach Workers: Development of a Tuberculin Skin Test Training Program" (J. Boutotte, et al)

In addition, Division staff also participated in the meeting as follows:

* Ed Nardell and Linda Singleton chaired "Meet the Professor" Seminars

* Sue Etkind and Janice Boutotte lectured at the National TB Nurses Network meeting

* Ed Nardell chaired and Sue Etkind presented a paper for a mini-symposium

E. ABSTRACTS ACCEPTED

* American Thoracic Society/American Lung Association Annual Meeting in San Francisco, 1993

"Missed Opportunities in Massachusetts", (S. Etkind, et al)

" CBO's: a New Generation for TB Control", (L. Singleton, et al)

" Empowering Outreach Workers", (D. DeBiasi, et al)

"Is Upper Room UV Germicidal Air Disinfection Safe?", (E. Nardell)

"The American Nurses Association's Commitment to the Elimination of TB", (J. Boutotte)

" Eight Year Follow-up of INH/SM Resistant TB Among Boston's Homeless", (J. Bernardo, et al)

E. ARTICLES PUBLISHED:

"Nurses Needed to Combat TB - As I see It", J. Boutotte, in the American Nurse, June 1992

F. ARTICLES/CHAPTERS PENDING:

For Medical Clinics of North America:

"Environmental Control of Tuberculosis", E. Nardell

"The Role of the Public Health Department in Tuberculosis", S. Etkind

For United States Congress Office of Technology Assessment:

" Delivery of Treatment for Tuberculosis", S. Etkind

For American Jail journal:

" TB in Corrections: the Need for a Corrections/Public Health Partnership", S. Etkind, T. Aberdale, and J. Boutotte

For Tuberculosis: A Comprehensive International Approach:

"Transmission and Pathogenesis", E. Nardell

"Contact Tracing", S. Etkind

VII. EVALUATION ACTIVITIES:

A. CDC PROGRAM MANAGEMENT REPORTS:

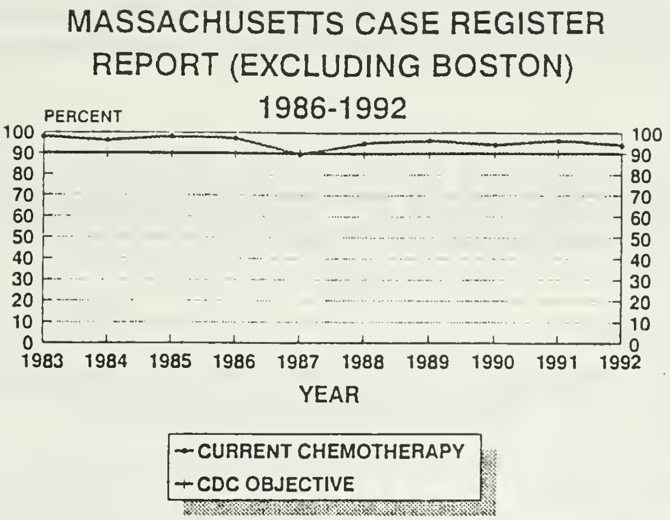
NOTE: The program management reports exclude data from the City of Boston as Boston submits these reports separately. Therefore the objectives and indicators discussed below only reflect data from outside of Boston.

Objective 1:

1) Case Register Report

At least 90% of patients for whom two or more drugs are recommended will be on current chemotherapy.

The report for the period of July 1, 1992 to December 31, 1992, indicates that **93.9** percent of tuberculosis patients for whom two or more drugs were recommended, wer on current chemotherapy, indicating that **THIS OBJECTIVE HAS BEEN EXCEEDED** by t Commonwealth (excluding Boston). This objective has been consistently achieved sinc the original awarding of the Cooperative Agreement.

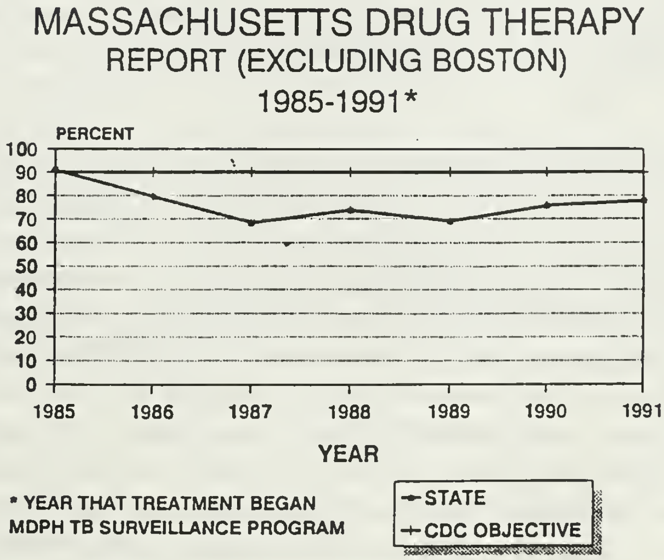

MASSACHUSETTS CASE REGISTER
REPORT (EXCLUDING BOSTON)
1986-1992

MDPH TB SURVEIVLLANCE PROGRAM

2) Drug Therapy Reports

At least 90 percent of newly diagnosed cases of TB will complete an American Thoracic Society/Centers for Disease Control (ATS/CDC) recommended regimen of antituberculosis drug therapy.

Data for Massachusetts (excluding Boston) for persons diagnosed during the periods of January through June, 1991 and for July through December 1991, indicate that 84.8% and 74.2% respectively of persons starting therapy completed a recommended course of treatment within 12 months; the index for 1991 overall averages 77.8%. which is a slight increase from 1990.

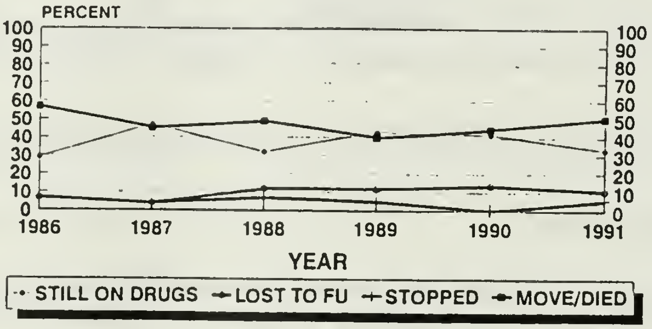

MASSACHUSETTS DRUG THERAPY
REPORT (EXCLUDING BOSTON)
1985-1991*

* YEAR THAT TREATMENT BEGAN
MDPH TB SURVEILLANCE PROGRAM

Thirty-three percent of those cases indicated as not having completed therapy in 1991 received treatment beyond 12 months. Of those cases still on medication, 18% were drug resistant cases prescribed regimens requiring more than 12 months of treatment.

The reasons for noncompletion of therapy in the remainder of those cases not completing a recommended course of therapy within 12 months are as follows: 29% died, 21% moved with records referred, 11% were lost to follow-up and 5% stopped meds.

MASSACHUSETTS CASES NOT COMPLETING
THERAPY (EXCLUDING BOSTON)
1986-1991*

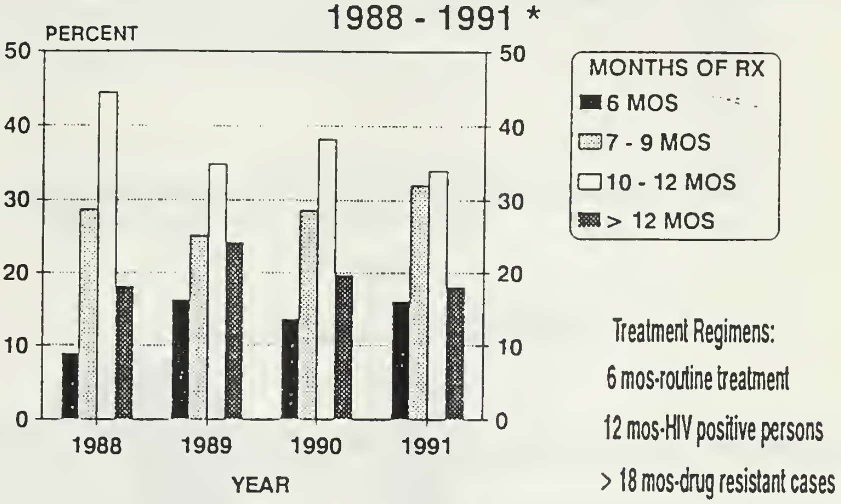


*YEAR TREATMENT BEGAN
MDPH TB SURVEILLANCE PROGRAM

When analyzed over time, the data suggests that the percent of cases completing therapy decreased from 1985 - 1989; however, it is clear that if we exclude those categories over which the Division has little control (died, moved, longer therapy due to drug resistance, etc.), then **91.3%** of the cases in 1991 completed therapy, and if we include those persons who have since completed a recommended course of treatment, then **91.9%** of the cases in 1991 actually completed therapy. indicating that **THIS OBJECTIVE HAS BEEN ACHIEVED.**

When drug treatment regimens are analyzed over time, it is clear that the percent of cases prescribed six months of treatment has increased only slightly. However, in 1992 the length of treatment for the majority of cases decreased from 12 months to 9 months. The Division has taken steps to encourage the use of 6-month treatment regimens when not otherwise contraindicated. A new referral system has been implemented to refer cases to our physician for intervention when the TSA nurses deem that the treatment regimens are not appropriate. Also, the Division has begun to hold bimonthly staff meetings in the regions, inviting the TB clinic staff and health departments from the high risk communities to attend these meetings. At the meetings, treatment regimens are discussed, and feedback is given to the clinics regarding their specific cases, using charts and graphs to compare the clinic outcomes against the state outcomes, and the national objectives. Also, case conferences will begin in 1993 to discuss specific patient management issues; these meetings will include Dr. Nardell, the TSA nurses, the outreach nurse coordinator, the Refugee Health Program staff, and the MDR-TB nurse educator.

TREATMENT REGIMENS OF TUBERCULOSIS CASES
MASSACHUSETTS (EXCLUDING BOSTON)
1988 - 1991 *



Treatment Regimens:
6 mos-routine treatment
12 mos-HIV positive persons
> 18 mos-drug resistant cases

* YEAR THAT TREATMENT BEGAN MDPH TB SURVEILLANCE PROGRAM

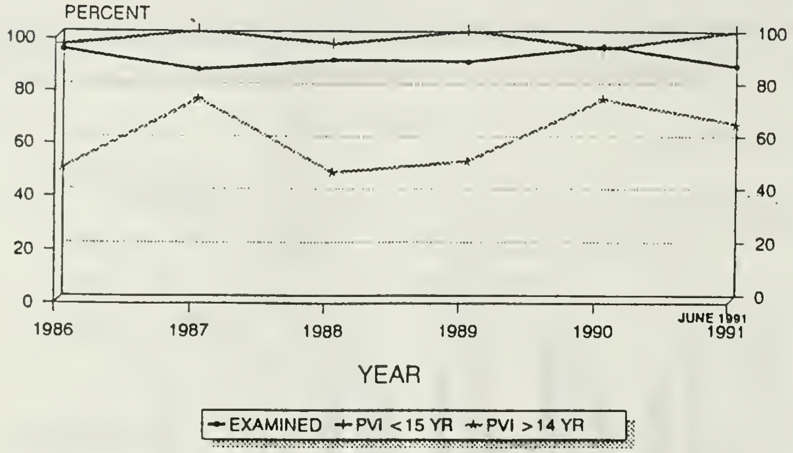
Objective 2: Contact Report

At least 95 percent of close contacts to infectious TB cases will receive examinations, with at least 95 percent of infected contacts under 15 years of age and 75 percent of infected contacts 15 years of age and over placed on preventive treatment.

Data for Massachusetts, excluding Boston, for contacts to TB cases during the period of July through December 1991, indicate that **86.8 percent** of close contacts to infectious cases who were identified were examined, indicating that **THIS PART OF OBJECTIVE 2 STILL NEEDS SOME WORK.** Of infected contacts under 15 years of age, **100 percent** were placed on preventive therapy, indicating that **THIS PART OF OBJECTIVE 2 HAS BEEN EXCEEDED.**

Of infected contacts over 15 years of age, **64.4 percent** were placed on preventive therapy. This is similar to the previous reporting period. **THIS PART OF THE OBJECTIVE NEEDS MORE WORK.**

MASSACHUSETTS CONTACT AND OTHER INFECTED PERSONS REPORT (EXCLUDING BOSTON)
1986 - 1991

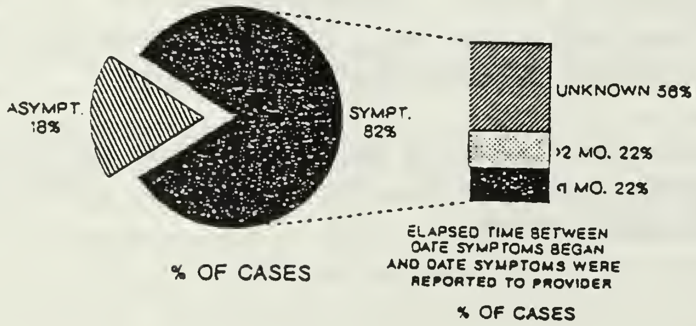


B. MDR-TB QUALITY ASSURANCE MEASURES

Symptom reporting lag:

Eighteen percent of the MDR-TB cases had no symptoms of disease. Of those cases with symptoms, 56% had no documentation of when symptoms began (50% began treatment in a foreign country). An additional 22% reported symptoms to the provider within one month of onset as well as 22% reporting symptoms more than two months after onset.

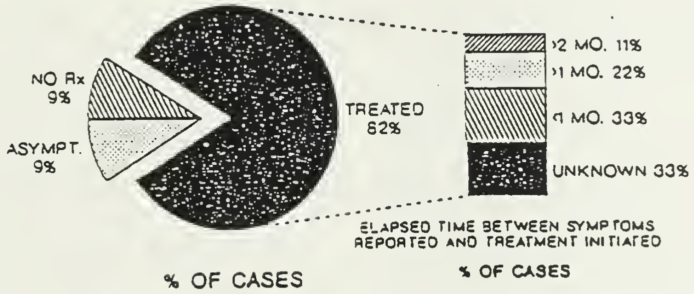
MASSACHUSETTS MDR-TB CASES
SYMPTOMS REPORTED TO PROVIDER
1992 (n=11)



Treatment initiation lag:

Nine percent of the MDR-TB cases did not receive treatment (diagnosis was after death). An additional 9% did not present with symptoms. Of those cases with symptoms, 22% began treatment within the month of reporting the symptoms (66% of those began treatment within one week). Thirty three percent lacked documentation to determine the lag time between symptoms onset and treatment initiation (66% of those began treatment in a foreign country). An additional 22% began treatment within two months, and 11% began treatment two months after symptoms had been reported to the provider.

MASSACHUSETTS MDR TB CASES
TREATMENT INITIATION LAG
1992 (n=11)



C. OTHER EVALUATION ACTIVITIES

* Completed the 1991 Annual Report and 6 Month Activity Report

* Completed the Performance Management and EPRS evaluations

* Conducted a Division retreat to plan goals and objectives for FY93 and submitted them to Dr. DeMaria

* Conducted a retreat to review Division activities for the first 6 months of FY93 and review progress toward established goals and objectives

APPENDICES

APPENDICES

1. TB "High Risk" City List
2. Case Rates by Community
3. Age/Sex Table
4. Disease Site List
5. Multiple Site List
6. Drug Resistance List by Drug
7. Drug Resistancee List by Type
8. Drug Resistant Cases by Country of Origin
9. Age/Race/Ethnicity Table
10. Place of Birth List
11. TB/AIDS Case Characteristics
12. TB/AIDS Disease Site List
13. List: Members of the Massachusetts Commission for the Elimination of Tuberculosis

Appendix 1

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF TUBERCULOSIS CONTROL

Number of Tuberculosis Cases for Boston, 21 High-Risk Communities, and Remainder of Communities Reporting Cases for 1986 - 1992 and Seven Year Average

COMMUNITY	1992	1991	1990	1989	1988	1987	1986	7-Year Average
	Number Cases							
Boston	128	141	149	142	132	126	141	118
PERCENT OF STATE	30%	32%	34%	34%	35%	32%	33%	33%
	Number Cases							
Arlington	*	*	*	6	*	*	0	4
Brockton	22	22	21	10	15	12	13	14
Brookline	5	*	0	*	6	*	7	3
Cambridge	13	9	14	25	10	19	14	11
Chelsea	6	10	5	*	*	*	*	5
Fall River	5	15	5	8	6	5	*	7
Fitchburg	0	6	7	9	6	5	5	6
Framingham	*	6	7	10	5	5	*	5
Holyoke	*	*	*	*	*	10	*	3
Lawrence	12	11	6	*	*	6	5	6
Leominster	*	*	*	7	*	*	6	3
Lowell	11	12	15	12	13	10	17	11
Lynn	10	6	13	*	4	16	9	9
Malden	11	8	5	6	*	*	*	4
Medford	9	*	*	0	5	7	*	3
New Bedford	6	9	11	12	6	10	11	8
Quincy	13	9	*	7	6	6	*	14
Revere	6	*	5	7	*	*	5	12
Somerville	12	14	5	11	10	13	8	9
Springfield	14	11	13	10	17	10	17	12
Worcester	16	14	12	16	10	9	13	11
TOTAL THESE 19 COMMUNITIES	174	178	160	174	143	163	150	156
PERCENT OF STATE	41%	41%	37%	41%	37%	41%	35%	39%
TOTAL CASES 331 REMAINING COMMUNITIES	126	117	129	105	107	107	137	103
PERCENT OF STATE	29%	27%	29%	25%	28%	27%	32%	28%
TOTAL CASES IN STATE	428	436	438	421	382	396	428	358

* = Less than 5 cases

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
DIVISION OF TUBERCULOSIS CONTROL

Seven-Year-Mean Case Rates for Communities with above State Average Tuberculosis Case Rates (per 100,000 population) for 1986 - 1992

COMMUNITY	1992	1991	1990	1989	1988	1987	1986	7-Year Mean
Arlington	4.48	6.72	9.36	13.86	8.70	8.66	0.00	7.40
Boston	22.29	24.55	25.95	24.77	24.95	24.21	24.71	24.49
Brookline	9.14	5.48	0.00	5.70	11.28	7.52	13.13	7.46
Brockton	23.71	23.71	21.66	10.30	15.15	12.16	13.56	17.18
Cambridge	13.57	9.39	15.87	28.11	10.75	19.27	15.13	16.01
Chelsea	20.90	34.83	15.77	15.56	16.06	16.10	11.51	18.68
Fall River	5.39	16.18	5.60	8.92	6.69	5.58	4.35	7.53
Fitchburg	0.00	14.57	17.85	22.92	15.79	13.19	13.18	13.93
Framingham	1.54	9.23	11.00	15.68	9.26	7.77	4.66	8.45
Holyoke	4.58	2.29	9.64	7.17	7.04	23.50	6.96	8.74
Lawrence	17.09	15.67	9.59	6.38	6.50	9.76	7.76	10.39
Leominster	5.24	5.24	5.68	19.91	2.85	11.40	17.10	9.63
Lowell	11.60	11.60	15.95	12.78	13.98	10.75	18.19	13.55
Lynn	12.31	7.39	16.63	5.11	5.24	21.00	11.35	11.29
Malden	20.41	14.85	9.39	11.26	7.84	1.94	1.94	9.66
Medford	15.68	5.23	5.33	0.00	9.09	12.73	5.45	7.64
New Bedford	6.00	9.01	11.39	12.40	6.22	10.36	11.25	9.52
Quincy	15.30	10.59	3.69	8.57	6.19	7.19	3.59	7.87
Revere	14.02	9.35	11.29	15.86	9.63	7.23	12.04	11.35
Somerville	15.75	18.37	7.01	15.29	13.33	17.28	10.55	13.94
Springfield	8.92	7.01	8.94	6.84	11.86	6.81	11.30	8.81
Worcester	9.43	8.25	7.76	10.29	6.41	5.77	8.33	8.03
STATE AVERAGE CASE RATE FOR YEAR	7.11	7.25	7.43	7.16	6.66	6.92	7.38	7.13

Appendix 2

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	#CASES	RATE/100,000	RANK
BARNSTABLE	4 Communities	6		-
BERKSHIRE	2 Community	2		

* Only communities with => 4 ranked

MDPH TB DIVISION OF TB CONTROL

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RAtES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
BRISTOL	7 Communities	10	-	-
	Fall River	5	5.29	29
	New Bedford	6	6.00	28
DUKE		-	-	-

*Only communities with => 4 ranked

MDPH DIVISION OF TB CONTROL

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
ESSEX				
	9 Communities	12	-	-
	Lawrence	12	17.09	6
	Lynn	10	12.31	15
FRANKLIN				
	1 Communities	1	-	-

*Only communities with => 4 cases

MDPH DIVISION OF TB CONTROL

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
HAMPDEN				
	5 Communities	6	-	-
	Springfield	14	8.92	23
HAMPSHIRE				
	2 Community	4	-	-

*Only communities with => 4 ranked

MDPH DIVISION OF TB CONTROL

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
MIDDLESEX				
	16 Communities	25	-	-
	Cambridge	13	13.57	14
	Lowell	11	10.63	18
	Malden	11	20.41	5
	Medford	9	15.68	31
	Natick	5	16.39	-
	Somerville	12	15.75	9
	Waltham	7	12.09	16

MDPH DIVISION OF TB CONTROL

*Only communities with => 4 ranked

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
NANTUCKET	–	–	–	–
NORFOLK				
	9 Communities	17	–	–
	Brookline	5	9.14	29
	Quincy	13	15.30	16
	Randolph	5	16.62	17

Only communities with =>4 cases ranked

MDPH DIVISION OF TB CONTROL

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	# CASES	RATE/100,000	RANK
PLYMOUTH				
	8 Communities	13		
	Brockton	22	23.71	2
SUFFOLK				
	Boston	128	22.29	3
	Chelsea	6	20.9	4
	Revere	6	14.02	12

SURVEILLANCE PROGRAM *Only communities with => 4 ranked

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

COUNTY	COMMUNITY	3 CASES	RATE/100,000	RANK
WORCESTER				
	8 Communities	13		
	Worcester	16	9.43	21

MDPH TB SURVEILLANCE PROGRAM * Only communities with =>4 ranked

1992 MASSACHUSETTS TB CASES BY COUNTY & COMMUNITY WITH CASE RATES AND RANKING*

	# CASES	RATE/100,000
STATE AT LARGE	2	
STATE TOTAL	428	7.11

MDPH TB SURVEILLANCE PROGRAM

MASSACHUSETTS 1992

TUBERCULOSIS CASES BY AGE AND SEX

AGE	MALE		FEMALE		TOTAL	
	CASES	%	CASES	%	CASES	%
1 - 04	5	1.2	2	.5	7	1.7
5 - 09	3	.7	2	.5	5	1.2
10 - 14	2	.5	2	.5	4	1.0
15 - 19	1	.2	6	1.4	7	1.6
20 - 29	41	9.5	33	7.7	74	17.2
30 - 39	59	13.8	46	10.8	105	24.6
40 - 49	44	10.3	13	3.0	57	13.3
50 - 59	30	7.0	13	3.0	43	10.0
60+	70	16.4	56	13.0	126	29.4
TOTAL	255	59.6	173	40.4	428	100.0

MDPH TB SURVEILLANCE PROGRAM

MASSACHUSETTS 1992 TUBERCULOSIS CASES BY PRIMARY DISEASE SITE

SITE	NUMBER CASES	PERCENT
PULMONARY	297	69.4
LYMPHCERVICAL	44	10.3
PLEURAL	28	6.6
GENITOURINARY	11	2.6
LYMPHOTHER	10	2.3
MILIARY	7	1.6
BONE/JOINT	6	1.4
MENINGITIS	5	1.2
OTHER	20	4.6
TOTAL	428	100

MDPH TB SURVEILLANCE PROGRAM

TUBERCULOSIS CASES WITH MULTIPLE SITES
MASSACHUSETTS 1992 - 29 CASES/ 62 SITES

SITES	NUMBER SITES	PERCENT *
PULMONARY	24	82.7
PLEURAL	10	34.5
GENITOURINARY	7	24.1
BONE/JOINT	5	17.2
MILIARY	4	13.8
LYMPHCERVICAL	3	10.3
PERITONEAL	2	6.7
BLOOD	2	6.7
COLON	1	3.5
EYE	1	3.5
LYMPHINTRA	1	3.5
LYMPHOTHER	1	3.5
SKIN	1	3.5
TOTAL	75	

MDPH TB SURVEILLANCE PROGRAM * Percent of Cases with Multiple Sites

TUBERCULOSIS DRUG RESISTANCE DATA
MASSACHUSETTS 1992

MEDICATION(ALL DOSAGE STRENGTHS)	CASES	PERCENT
INH	19	34.6
INH/SM	12	21.8
SM	5	9
INH/RIF	3	5.5
INH/PZA	2	3.7
RIF	2	3.7
INH/RIF/SM	2	3.7
INH/RIF/EMB/SM	1	1.8
INH/RIF/EMB/SM/KANA/ETH/CAP	1	1.8
INH/RIF/SM/ETH	1	1.8
INH/EMB/SM	1	1.8
INH/EMB/SM/ETH	1	1.8
INH/SM/ETH	1	1.8
INH/ETH	1	1.8
EMB	1	1.8
EMB/SM	1	1.8
INH/SM/KANA	1	1.8
*TOTAL	55	100

*Includes 5 cases whose resistance emerged in 1992

TUBERCULOSIS DRUG RESISTANCE

MASSACHUSETTS 1992

	# CASES	%
TUBERCULOSIS CASES	428	100
TUBERCULOSIS CASES W DRUG RESISTANCE	51	11.9
BACTERIOLOGICALLY CONFIRMED TB CASES	316	73.8
BACTERIOLOGICALLY CONFIRMED CASES W DRUG RESISTANCE	49	15.5

MDPH TB SURVEILLANCE PROGRAM

MASSACHUSETTS 1992 DRUG RESISTANT TUBERCULOSIS CASES BY COUNTRY OF ORIGIN

COUNTRY	NUMBER	PERCENT
UNITED STATES	24	43.7
VIETNAM	7	12.7
HAITI	7	12.7
CAMBODIA	3	5.5
DOMINICAN REPUBLIC	3	5.5
INDIA	2	3.7
NEPAL	1	1.8
MALAYSIA	1	1.8
NICARAGUA	1	1.8
PHILIPPINES	1	1.8
CHINA	1	1.8
PORTUGAL	1	1.8
CHINA	1	1.8
PORTUGAL	1	1.8
INDONESIA	1	1.8
KOREA	1	1.8
CUBA	1	1.8
TOTAL	55*	100

MDPH TB SURVEILLANCE PROGRAM

*5 cases from prior years developed resistance in 1992

1992 VERIFIED TUBERCULOSIS CASES
AGE, RACE & SEX DISTRIBUTION

	WHITE, NOT HISPANIC		BLACK, NOT HISPANIC		HISPANIC		ASIAN/PACIFIC ISLANDER		AMERICAN INDIAN		NOT SPECIFIED		TOTALS		
E	M	F	M	F	M	F	M	F	M	F	M	F	M	F	BOTH
-4	0	0	3	1	0	1	2	0	0	0	0	0	5	2	7
-9	1	1	2	0	0	1	0	0	0	0	0	0	3	2	5
-14	0	0	1	2	0	0	1	0	0	0	0	0	2	2	4
-19	0	1	0	3	0	1	1	1	0	0	0	0	1	6	7
-24	1	1	3	3	1	4	7	6	1	0	0	0	13	14	27
-29	8	3	10	6	9	3	1	6	0	0	0	1	28	19	47
-34	7	10	9	6	6	2	5	6	0	0	0	0	27	24	51
-39	6	7	10	5	8	5	8	5	0	0	0	0	32	22	54
-44	10	0	5	3	2	0	5	5	0	0	0	0	22	8	30
-54	18	4	6	4	3	2	9	3	0	0	0	0	36	13	49
-64	22	3	5	5	1	2	4	6	0	0	0	0	32	16	48
-UP	39	33	4	4	3	0	6	9	1	0	0	0	53	46	99
TAL	112	63	58	42	33	21	49	47	2	0	0	1	254	174	428

Appendix 10

MASSACHUSETTS 1992 TUBERCULOSIS
CASES BY PLACE OF BIRTH

COUNTRY	NUMBER	PERCENT
UNITED STATES	190	44.4
HAITI	35	8.2
VIETNAM	28	6.5
PUERTO RICO	20	4.7
INDIA	19	4.4
CHINA	15	3.5
CAMBODIA	13	3
DOMINICAN REPUBLIC	11	2.6
CAPE VERDE	9	2.1
PORTUGAL	9	21.1
BRAZIL	6	1.4
CANADA	6	1.4
HONG KONG	5	1.2
KOREA	5	1.2
33 OTHER COUNTRIES	57	13.3
TOTAL	428	100

MDPH TB SURVEILLANCE PROGRAM

TABLE 1

DEMOGRAPHIC CHARACTERISTICS
Massachusetts TB & AIDS Cases
1982 - December 31, 1992

	Cumulative TB & AIDS cases as of December 31, 1992 n= 259		Cumulative non_TB AIDS cases as of December 31, 1992 n= 5283*	
	No.	% of subgroup	No.	% of subgroup
RESIDENCE				
Boston	116	45%	1932	37%
SMSA	65	25%	1280	24%
Outside SMSA	69	27%	1763	33%
Out-of-state	9	3%	308	6%
TRANSMISSION CATEGORY				
Homosexual/Bisexual	53	20%	2903	55%
IV Drug User	90	35%	1243	24%
Homosexual/IVDA	13	5%	214	4%
Blood Transfusion	6	2%	121	2%
Hemophilia	1	0%	70	1%
Foreign born	80	31%	182	3%
Heterosexual Cases	10	4%	250	5%
Pediatric Cases	0	0%	115	2%
Undetermined	6	2%	185	4%
GENDER				
Male	216	83%	4589	87%
Female	43	17%	694	13%
VITALITY STATUS				
Alive	88	34%	1659	31%
Dead	167	64%	3525	67%
Unknown	4	2%	99	2%
RACE				
White	77	30%	3617	68%
Black	143	55%	996	19%
Hispanic	36	14%	634	12%
Other/Unknown	3	1%	36	1%
MEAN AGE AT DIAGNOSIS OF AIDS		35.71		35.73

* Includes AIDS cases reported as of December 31, 1992

MASSACHUSETTS TB/AIDS CASES BY TUBERCULOSIS SITE 1982 - 1992

259 Patients/333 Sites*

SITE	# of Patients	(%)
Pulmonary	155	47
Pleural	26	8
Lymphatic/cervical	37	11
Lymphatic/intrathoracic	5	2
Lymphatic/other	21	6
Lymphatic/unknown	5	2
Bone/joint	57	2
Genitourinary	10	3
Miliary	13	4
Peritoneal	5	2
Meningeal	7	2
Blood	5	2
Other**	31	9
Unknown	18	2
TOTAL SITES	333	100 %

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